APPENDIX A

PROTOCOL FOR VCP REMEDIATION GOALS LOOKUP TABLES

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PROTOCOL FOR VCP REMEDIATION GOAL
LOOKUP TABLES
NEBRASKA VOLUNTARY CLEANUP PROGRAM

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1.0 INTRODUCTION

This guidance describes the protocol employed by Nebraska Department of Environmental Quality (NDEQ) to establish chemical-specific and media-specific RGs for soil, soil gas, and groundwater that are protective of human health and the environment. NDEQ created this document to support a consistent and streamlined decision-making process for sites being managed under the Nebraska Voluntary Cleanup Program (VCP). The goal is to use this guidance as one tool to identify RGs for a site in the VCP. This document generally refers to RGs as "VCP RGs."

The protocol described in this guidance reflects approaches and procedures for establishing RGs that NDEQ, other state agencies, and the U.S. Environmental Protection Agency (U.S. EPA) use in existing programs to assess potential human health risks posed by potential exposure to environmental contamination. The bases of this approach are the U.S. EPA guidance and directives established to support the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). In addition, this document relies on Nebraska standards promulgated under Title 117—Nebraska Surface Water Quality Standards (NDEQ 2014) and Title 118—Ground Water Quality Standards and Use Classification (NDEQ 2006). This protocol resulted from discussions between NDEQ and Nebraska Health and Human Services Systems (NHHSS) personnel. Importantly, VCP RGs developed in this document are not static, but "living" benchmarks that will be periodically revised as significant new exposure and toxicological information becomes available.

Complexities of contaminated sites vary widely in physical and contaminant characteristics, exposure factors, and resultant risks and hazards. This protocol aims to provide an acceptable level of protectiveness and flexibility that will promote high-quality, effective, and efficient cleanups by:

- Streamlining decision-making
- Framing a consistent approach
- Ensuring remedial action that protects human health and the environment

- Providing flexibility either to use risk-based lookup tables or to develop site-specific risk-based cleanup goals
- Considering land use
- Maintaining consistency with NDEQ and U.S. EPA guidance.

The remaining sections of this guidance provide an overview of the protocol (Section 2.0); describe the tiered approach for establishing VCP RGs (Section 3.0), specify procedures for developing the VCP RG lookup tables (Section 4.0); furnish a guide to interpreting the VCP RG lookup tables (Section 5.0); discuss the technical documentation supporting the VCP RG lookup tables, including assumptions used to calculate the VCP RGs (Section 6.0) and summarize the document (Section 7.0). The following attachments are also provided to provide the VCP RG tables and supporting information for the development of the VCP RGs:

Attachment A	VCP Remediation Goal Lookup Tables
Attachment B	Supporting Tables for Calculating the VCP Remediation Goals
Attachment C	Standardized Equations for Calculating the VCP Remediation Goals
Attachment D	Approach for the Development of Remediation Goals for the Vapor Intrusion to Indoor Air Exposure Pathway
Attachment E	Target Organs for Noncarcinogenic Effects of Various Contaminants
Attachment F	EPA Region 7 Action Levels for Trichloroethylene in Air
Attachment G	Glossary and Acronyms.

2.0 OVERVIEW

The following sections describe various aspects of the VCP RG protocol approach, including the three tiers of the VCP RG approach, as discussed in Section 2.1. This protocol focuses on Tier 2 values, referred to as VCP RGs, but also presents the Tier 1 and Tier 3 options. Section 2.2 outlines the assessment of noncancer hazards and carcinogenic risks associated with exposure to site-related contaminants, including the assessment of multiple contaminants undergoing a Tier 2 evaluation. Section 2.3 discusses the requirements for determining the assessment of risk to ecological receptors.

2.1 VCP REMEDIATION GOAL PROTOCOL

The VCP RG protocol is based on a three-tiered approach: (1) determine if contamination identified on site is greater than background levels (Tier 1); (2) use a set of VCP RG lookup tables (Tier 2); and (3) develop site-specific remediation goals (Tier 3). The Tier 2 approach is similar to methodologies followed to develop risk-based screening levels by U.S. EPA in "Regional Screening Levels" (RSL) (U.S. EPA 2018a and b); many other state voluntary cleanup programs that use risk-based lookup tables; and the Tier 1 lookup tables in NDEQ's Risk-Based Corrective Action (RBCA) at Petroleum Release Sites: Tier 1/Tier 2 Assessments (NDEQ 2009). The Tier 3 approach is similar to other approaches under existing U.S. EPA and NDEQ guidance. These approaches range from: (1) completing a baseline risk assessment in accordance with U.S. EPA's Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (Part A) (RAGS Part A) (U.S. EPA 1989), to (2) modifying only certain exposure pathways and assumptions to reflect site-specific conditions, to (3) using site-specific values for fate and transport parameters consistent with the Tier 2 approach in NDEQ's RBCA at Petroleum Release Sites (NDEQ 2009).

2.2 NONCARCINOGENIC HAZARDS AND CARCINOGENIC RISKS

VCP RGs were developed to assess both adverse noncarcinogenic health effects and carcinogenic risks that may be associated with chronic (i.e. long-term) exposure to site-related contaminants. In cases where a contaminant is both a carcinogen and may also be associated with adverse noncarcinogenic effects, the VCP RG provided is based on the lower (more conservative) of the two values.

For noncarcinogenic effects, protective mechanisms in the body are believed to exist that must be overcome before adverse effect is manifested. As a result, exposure to a contaminant can be tolerated with expression of adverse effects up to a threshold level. This threshold level is referred to as the reference dose (RfD) for oral or dermal exposure or reference concentration (RfC) for inhalation exposure. The general assumption

is that exposure below the RfD or RfC will pose no appreciable risk of adverse effects on human health, including health to sensitive populations during a lifetime. For non-carcinogenic contaminants, the measure used to describe the potential for non-carcinogenic toxicity in an individual is not expressed as a probability, but as a ratio of predicted exposure to acceptable exposure. This ratio is called the hazard quotient (HQ). The HQ assumes that there is a level of exposure (i.e., a threshold) below which it is unlikely that adverse health effects would occur. If the exposure level exceeds this threshold there is a concern for potential noncarcinogenic effects.

For residential exposure to site-related contaminants that may be associated with adverse noncarcinogenic effects, the VCP RGs are set with a HQ of 0.25. This conservative assumption is believed to be protective of not only sensitive populations but considers the potential exposure to more than one contaminant. For workplace exposure, industrial VCP RGs are set at a HQ of 1.0. When an individual is exposed to multiple noncarcinogenic contaminants, the sum of HQs calculated for an exposure pathway (the way a contaminant comes in contact with an individual – e.g., ingestion, inhalation) is referred to a Hazard Index (HI). For both residential and industrial VCP RGs, a target organ-specific HI greater than 1.0 is not to be exceeded. See Section 4.3 for further information on HQs and HIs.

For carcinogens, risks are estimated as the probability of an individual developing cancer over a lifetime as a result of chronic exposure to contaminated media. A risk evaluation based on the presumption of a threshold is inappropriate for carcinogens. The underlying presumption for carcinogens is that the introduction of even one molecule of the contaminant can cause cancer in an individual even if the probability is very low. This conservative, "non-threshold" concept is used because it is presumed that there is no level of exposure to a carcinogen that does not pose a certain level of risk. Because the threshold concept is not acceptable for carcinogens, a value different from a RfD that quantifies the relationship between dose and response must be developed. This value is known as a slope factor (SF) for ingestion and dermal exposures and inhalation unit risk factor (IUR) for inhalation exposures.

The chemical-specific SF or IUR represents the carcinogenic risk factor: the greater the SF or IUR, the greater the potential for that contaminant to cause a cancer over a lifetime. The SF (along with an estimated dose) or IUR is used to calculate a probability of excess cancers occurring over a lifetime. The probability is expressed as an excess probability of an *individual* (not a population) developing cancer over a lifetime as a result of exposure to the carcinogen. This incremental or excess individual lifetime cancer risk exceeds the background cancer risk (for example, it is expressed as one excess cancer incidence per 1,000,000 population [1 in 1,000,000] or 1×10^{-6}). U.S. EPA's National Contingency Plan (NCP) (U.S. EPA 1990) has established 1×10^{-6} as a point of departure for determining remediation decisions when applicable,

relevant, and appropriate regulations are not available. For the residential VCP RGs a point of departure of 1×10^{-6} has also been selected, therefore VCP RGs that are based on carcinogenic risks were set an excess cancer risk level of 1×10^{-6}. U.S. EPA guidance indicates that action is generally warranted when the cumulative carcinogenic risk for exposure to one or more carcinogens is greater than 1×10^{-4} (1 in 10,000) EPA 1991. For residential VCP RGs, a combined cumulative cancer risk 1×10^{-5} (1 in 100,000) should not be exceeded. For workplace exposure the industrial VCP RGs are based on an excess cancer risk level of 1×10^{-5} and a combined cumulative cancer risk of 1×10^{-4} should not be exceeded. See Section 4.2 for further information.

2.3 ECOLOGICAL RECEPTORS

The VCP RG lookup tables used in Tier 2 are not designed to protect ecological receptors. U.S. EPA and other agencies have not yet developed a comprehensive set of lookup tables for ecological screening levels because ecological settings are so complex. Development of VCP RGs for ecological receptors therefore first requires reasonable support for assuming a complete exposure pathway exists for these receptors. Under the VCP, the participant is required to answer a series of questions about significant ecological receptors at or adjacent to the site. These questions address the site's proximity to sensitive habitats, known ecological receptors in the area, presence of threatened or endangered species near the site, and other information on ecological receptors. These questions are listed below:

- If contamination is present at the site, is all soil contamination below 15 feet?
- Is less than 0.25 acre of contiguous undeveloped land on or within 500 feet of any area of the site?
- Are any of the following contaminants present: chlorinated dioxins or furans, polychlorinated biphenyl mixtures, dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethene (DDE), dichlorodiphenyldichloroethane (DDD), aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene?
- For sites that do not contain any contaminants listed above, are more than 1.5 acres of contiguous undeveloped land on or within 500 feet of any area of the site?
- Does the site have any features that would obviously eliminate specific exposure pathways, such as paving or other permanent barriers?
- Does the site contain or is it likely to contain special status species or habitats?
- Does groundwater from the site discharge to a water body or wetland?

The VCP participant should provide answers to these questions to NDEQ, which will review them with assistance from other appropriate state or federal agencies. If a site is found to have a viable ecological population and a chemical of potential ecological concern (COPEC) is present, the participant should conduct an ecological risk assessment at the site in accordance with U.S. EPA's Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (U.S. EPA 1997). The risk assessment will then be used to establish VCP RGs under direction of NDEQ. Site-specific ecological VCP RGs then will be developed using the exposure assumptions from this assessment. For surface water, the VCP RGs should be consistent with Title 117—Nebraska Surface Water Quality Standards, Chapter 4, Section 003, Aquatic Life (NDEQ 2014).

3.0 TIERED APPROACH

The following sections describe the three-tiered approach to establishing VCP RGs for contaminated sites. The protocol assumes that before the tiered approach is applied to any VCP site, the site has been thoroughly characterized according to information outlined in VCP guidance. This site characterization includes identifying the nature and extent of contamination, defining the land use (current and future), determining groundwater use, and identifying potential receptors. Development of a conceptual site model that clearly identifies all contaminant sources and their migration pathways as well as potentially exposed individuals (i.e., residents, industrial workers) is also necessary. Note that for simplicity, this document and the VCP RG lookup tables refer to industrial-commercial workers and the industrial-commercial land use scenario as "industrial" instead of industrial-commercial.

3.1 TIER 1

The Tier 1 evaluation compares contaminants identified on site with site-specific background levels for those contaminants that may also be naturally occurring. Background samples furnish a baseline measurement to assess the degree of contamination at a site. Whether background samples are truly uncontaminated should be determined—if contaminants of potential concern (COPC) are detected in the background samples, assessment should proceed as to whether they are anthropogenic (man-made) in origin and not site-related, present at naturally occurring levels, or actual site contaminants. Anthropogenic contaminant concentrations result from man-made sources (e.g., automobile traffic).

A basic assumption for Tier 1 is that contaminants at a site are related to site activities and are not considered background. The background evaluation focuses on inorganic contaminants, as most organic compounds found at contaminated sites are not naturally occurring (although they may be ubiquitous) and may also include certain contaminants naturally enriched in various environments. As part of the site investigation, site-specific background levels for soil and groundwater should be established. Analytical results for site soil should be compared to soils of similar soil type, and analytical results for site groundwater should be compared to groundwater from the same water-bearing unit.

NDEQ recognizes that a number of naturally occurring inorganic contaminants are present at sites in varying concentrations. These contaminants may include metals (lead, arsenic, chromium, and others) and other inorganics (such as chloride and natural nitrate). In addition, organic contaminants may be present in background due to their widespread human sources (polycyclic aromatic hydrocarbons and dioxins) but are considered anthropogenic (man-made) contamination. Tier 1 is designed to address primarily background contaminant situations; anthropogenic concentrations should not be screened out at Tier 1 and need to be

carried through Tier 2. An assessment should be made as to whether contaminants are present at the site as naturally occurring soil and groundwater compounds or represent contamination associated with past site activity.

The VCP participant should evaluate analytical results of contaminant concentrations found at the site to determine if they are within the range of background conditions. Any contaminant found at or below inorganic background levels is not considered a COPC and does not need to be included in the remedial action plan for the site. To determine whether a contaminant is above background, the participant should follow the procedures outlined in U.S. EPA's Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (U.S. EPA 2002a), American Society for Testing and Materials (ASTM) D6312-98 "Standard Guide for Developing Appropriate Statistical Approaches for Groundwater Detection Monitoring Programs" (ASTM 1998), or a functional equivalent. A contaminant found above inorganic background levels, determined either by direct comparison or appropriate statistics, is a COPC.

3.2 TIER 2

The Tier 2 evaluation compares concentrations of COPCs found on site with VCP RGs to determine if concentrations in soils, soil gas or groundwater are above the VCP RGs. The VCP RGs tables are provided in Attachment A. Table A-1 provides the VCP RGs for groundwater and soil, while Table A-2 provides the RGs for the vapor intrusion pathway from both groundwater and soil vapor. The user may select the maximum concentration of a COPC or may calculate the upper confidence limit of the arithmetic mean for each COPC and use this value to compare with the appropriate VCP RG. This calculation may be completed using U.S. EPA's ProUCL Software, available at https://www.epa.gov/land-research/proucl-software. If the maximum concentration or the upper confidence limit of the arithmetic mean for contaminant concentrations are found at concentrations above the VCP RGs, the participant has two alternatives: either remediate the site to the values in the VCP RG lookup tables or develop a site-specific VCP RG under Tier 3. If a COPC is not on the VCP RG lookup tables, the participant should contact NDEQ to determine an appropriate VCP RG.

For each organic COPC, the soil's saturation concentration should be calculated (equations to calculate saturation concentrations are provided in Attachment C). At the soil saturation concentration, the absorptive limits of the soil particles, the solubility limits of the soil pore water, and saturation of soil pore air have been reached. Above this concentration, the contaminant may be present as a pure liquid phase (if the contaminant is liquid at ambient soil temperatures) or pure solid phase (if the contaminant is solid at

ambient soil temperatures). If the soil saturation concentration is lower than the risk-based VCP RG, the saturation concentration is used as the VCP RG.

VCP RGs are risk-based values designed to be protective of human health and the environment.

- For residential land use scenarios, the VCP RG in soil and soil gas is set at an excess cancer risk level of 1×10^{-6} for individual carcinogens and a cancer risk level of 1×10^{-5} for the cumulative carcinogenic effects of multiple carcinogenic COPCs. For noncarcinogens, the VCP RG is set at a HQ value of 0.25 and a target organ-specific HI for the combined effects of noncarcinogens of 1.0. The required cancer risk levels are further discussed in Section 4.2 and the required HQ and HI are further discussed in Section 4.3. Note that where the background concentration for a COPC exceeds an excess cancer risk level of 1×10^{-6} or a HQ value of 0.25, the background concentration becomes the VCP RG.

- For industrial land use scenarios, the VCP RG in soil and soil gas is set at an excess cancer risk level of 1×10^{-5} for individual carcinogens and a cancer risk level of 1×10^{-4} for the cumulative carcinogenic effects of multiple carcinogenic COPCs. The participant should contact NDEQ if more than 10 carcinogenic COPCs are present, which would exceed the target risk level of 1×10^{-4}. For noncarcinogens, the VCP RG is set at a HQ value of 1.0 and a target organ-specific HI for the combined effects of noncarcinogens of 1.0. The required cancer risk levels are further discussed in Section 4.2, and the required HQ and HI are further discussed in Section 4.3. Note that where the background concentration for a COPC exceeds an excess cancer risk level of 1×10^{-5} or a HQ value of 1.0, the background concentration becomes the VCP RG. If the participant decides to use the VCP RG for an industrial worker, the site should have an institutional control in place to ensure that future land uses remain only industrial.

- For direct contact exposures to groundwater (i.e., ingestion of groundwater), NDEQ has chosen to use promulgated Maximum Contaminant Levels (MCLs), where available, as the VCP RG. For COPCs not having an MCL, the VCP RG is set at an excess cancer risk level of 1×10^{-6} for individual carcinogens. For noncarcinogens with no MCL, the VCP RG is set at an HQ value of 0.25.

- For indirect exposure to groundwater (i.e., vapor intrusion from contaminated groundwater), VCP RGs are based on the appropriate land use scenario. For residential land use scenarios, the VCP RG is set at an excess cancer risk level of 1×10^{-6} for a carcinogen and an HQ value of 0.25 for noncarcinogens. For industrial land use scenarios, the VCP RG is set at an excess cancer risk level of 1×10^{-5} for carcinogens and an HQ value if 1.0 for noncarcinogens.

The VCP RG lookup tables are for protection of human health only, not for ecological receptors. Parameter values for all exposure assumptions are discussed in more detail in Section 6.0.

3.3 TIER 3

Tier 3 requires NDEQ's oversight of the entire process. Under Tier 3, the participant can develop site-specific, risk-based VCP RGs that are protective of human health. This site-specific approach may consist of a complete baseline risk assessment; modification of certain exposure pathways and assumptions to

reflect site-specific conditions; or use of site-specific values for fate and transport parameters consistent with the Tier 2 approach in NDEQ's RBCA at Petroleum Release Sites (NDEQ 2009). Tier 3 provides the participant an option to determine VCP RGs using models, formulas, risk and exposure assessment methods, and approaches other than those specified under Tier 2. Tier 3 can involve considerably more effort than Tiers 1 and 2, since the evaluation can be more complex. Performing a Tier 3 analysis may necessitate expanding the site investigation and the risk assessment, or including sophisticated contaminant fate and transport modeling. The following is a list of information that may be required to support Tier 3 VCP RGs:

- Site-specific geologic or hydrogeologic data
- Site-specific data required to support the accuracy of predictive fate and transport models
- Site-specific data to support alternative assumptions for exposure pathways and receptor models
- Site-specific data to support an alternative exposure point or point of compliance
- Site-specific information to support alternative future land uses.

The approach to developing Tier 3 VCP RGs should be consistent with U.S. EPA's Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual Part B, Development of Risk-based Preliminary Remediation Goals (RAGS Part B) (U.S. EPA 1991a) and other relevant U.S. EPA and NDEQ guidance (such as NDEQ's RBCA at Petroleum Release Sites: Tier 1/Tier 2 Assessments [NDEQ 2009]).

4.0 DEVELOPMENT OF VCP REMEDIATION GOAL LOOKUP TABLES

The exposure assumptions for the VCP RG lookup tables are largely based on default values, as outlined in U.S. EPA's current risk assessment guidance and NDEQ guidance:

- Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (U.S. EPA 2002b)
- Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Part B, Development of Risk-Based Preliminary Remediation Goals (U.S. EPA 1991a)
- RBCA at Petroleum Release Sites: Tier 1/Tier 2 Assessments – Appendixes D and E (NDEQ 2009)
- Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual Part E, Supplemental Guidance for Dermal Risk Assessment (U.S. EPA 2004)
- Child-Specific Exposure Factors Handbook (U.S. EPA 2008)
- Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Part F, Supplemental Guidance for Inhalation Risk Assessment (U.S. EPA 2009)
- Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120 (U.S. EPA 2014)

However, to be consistent with current NDEQ guidance and policies, and to reflect current conditions in Nebraska, some assumptions in the guidance above were modified for calculation of the VCP RGs. For ease of discussion, these assumptions have been differentiated into groups. The remainder of this section specifies and justifies the assumptions for developing human health VCP RG lookup tables under Tier 2 for the VCP.

4.1 EXPOSED POPULATIONS

Soil, soil gas, and groundwater related to vapor intrusion VCP RGs are developed for two exposure populations based on land use: (1) residents and (2) industrial workers. These two groups are most likely to be exposed to contamination released from a site in the VCP. Moreover, children are included in the residential population, thereby assuring protection of sensitive receptors. Other populations were considered, such as trespassers, recreationalists, or construction workers. However, the resident or industrial worker is exposed for a longer duration than these other populations and therefore is at higher risk from COPC exposure. Also, RAGS Part A (U.S. EPA 1989) identifies residential, commercial/industrial, and recreational land use as the land use categories most often applicable at

Superfund sites. As mentioned above, recreationalists have less exposure than residents, so the receptors chosen for the VCP RG lookup tables include residents (children and adults) and industrial workers.

Direct contact groundwater VCP RGs are based on Title 118—Ground Water Quality Standards and Use Classification—Appendix A, which considers exposure to residents (the most sensitive population group) (NDEQ 2006). In addition, exposure to volatile COPCs in groundwater via the vapor intrusion pathway are considered for both the residents (children and adults) and industrial workers. Finally, exposure to volatile COPCs in soil gas via the vapor intrusion pathway are considered for both the residents (children and adults) and industrial workers. Exposure pathways considered in the VCP RG lookup tables are as shown in Table 1.

4.2 TARGET CANCER RISK

The target cancer risk, a probability of an excess cancer over a lifetime, is set at different levels for soils, soil gas, and vapor intrusion from groundwater exposures based on two distinct populations: residential and industrial workers. The residential population is assumed to include sensitive populations such as elderly residents and children. To protect the most sensitive residential exposure groups, the target cancer risk for exposure to individual COPCs is set at 1 excess cancer in 1,000,000 population, or 1×10^{-6}. The target cancer risk level for the cumulative effects of multiple carcinogens is 1×10^{-5} for residential land use. If more than 10 carcinogenic COPCs are present for residential land use scenarios, NDEQ should be contacted to determine how to best adjust the VCP RGs so the 1×10^{-5} goal is met. Note that even if the cumulative risk level of 1×10^{-5} is met, each COPC must still meet a 1×10^{-6} risk level.

TABLE 1

RECEPTORS AND EXPOSURE PATHWAYS CONSIDERED IN THE VCP REMEDIATION GOAL LOOKUP TABLES

Exposure Medium	Exposure Pathway	Land Use	Receptor(s)
Soil	Incidental ingestion	Residential	Age-adjusted Adult and Child – carcinogens
			Child – noncarcinogens
	Inhalation of volatiles and particulates	Residential	Age-adjusted Adult and Child – carcinogens
			Child – noncarcinogens
	Dermal contact	Residential	Age-adjusted Adult and Child – carcinogens
			Child – noncarcinogens
	Incidental ingestion	Industrial	Adult Worker
	Inhalation of volatiles and particulates	Industrial	Adult Worker
	Dermal contact	Industrial	Adult Worker
Soil-to-Groundwater	Groundwater	Residential	Age-adjusted Adult and Child – carcinogens
			Child – noncarcinogens
Groundwater	Ingestion	Residential	Age-adjusted Adult and Child – carcinogens
			Child – noncarcinogens
	Dermal contact	Residential	Age-adjusted Adult and Child – carcinogens
			Child – noncarcinogens
	Inhalation of volatiles from Domestic Use	Residential	Age-adjusted Adult and Child – carcinogens
			Child – noncarcinogens
	Inhalation of Volatiles from Vapor Intrusion	Residential	Age-adjusted Adult and Child – carcinogens
			Child – noncarcinogens
		Industrial	Adult Worker
Soil Gas	Inhalation of Volatiles from Vapor Intrusion	Residential	Age-adjusted Adult and Child – carcinogens
			Child – noncarcinogens
		Industrial	Adult Worker

Since the industrial worker population is not anticipated to include the elderly and children, its excess target cancer risk is set at 1 in 100,000 population (1×10^{-5}). The target cancer risk level for the cumulative effects of multiple carcinogens is 1×10^{-4} for industrial land use. If more than 10 carcinogenic COPCs are present for industrial land use scenarios, NDEQ should be contacted to determine how to best adjust the VCP RGs so the 1×10^{-4} goal is met. Note that even if the cumulative risk level of 1×10^{-4} is met, each COPC must still meet a 1×10^{-5} risk level. As discussed earlier, if a participant decides to use the VCP RG for an industrial worker, the site should have an institutional control in place to ensure that future land uses remain only industrial.

VCP RGs for direct contact exposure to groundwater will be identified consistent with the approach outlined in Title 118—Ground Water Standards and Use Classification—Appendix A (NDEQ 2006). The receptor is assumed an adult resident and the target cancer risk for those compounds without Title 118 numerical standards is 1×10^{-6}. Absent a standard, however, VCP RGs are calculated in a manner similar to that for soils. This is discussed in more detail in Section 4.6.

4.3 TARGET HAZARD INDEX

The target HQ (established for individual noncarcinogens) are set at different levels for soils, soil gas, and vapor intrusion from groundwater based on two distinct populations: residential and industrial workers. The residential population is assumed to include sensitive populations such as elderly residents and children. The selected receptor-specific target HQ provide a high level of protection for the most sensitive populations that would be exposed almost exclusively in a residential setting. In addition, calculating a VCP RG for residential exposures to noncarcinogenic COPCs assumes a child as the receptor (this ensures the VCP RG is protective, since a child is more sensitive than an adult). Importantly, U.S. EPA's NCP identifies a target HI of 1.0 as the goal for combined effects of noncarcinogenic contaminants.

To protect the residential exposure groups, the HQ for exposure to individual COPCs in soils, soil gas, and groundwater related to potential vapor intrusion is set at 0.25. An HQ of 0.25 for exposure to soils provides a level of conservatism for sites with multiple noncarcinogenic contaminants. The target organ-specific HI for the cumulative effects of multiple noncarcinogens is 1.0 for residential land use. If more than four noncarcinogenic COPCs are present for residential land use scenarios, the participant should refer to Attachment E of this document, "Target Organs for Noncarcinogenic Effects of Various Contaminants." The number of contaminants affecting each target organ should be determined. If more than four COPCs affect a single target organ or multiple target organs (thereby exceeding the target organ-specific HI of 1.0), NDEQ should be contacted to determine how to best adjust the VCP RGs so the 1.0 goal is met. Note that

even if the cumulative HI of 1.0 is met, each individual COPC must still each meet an HQ of 0.25. If a COPC is present but not listed in the VCP RG lookup tables (and not on the list presented in Attachment E), the participant should contact NDEQ to determine if target organ effects are applicable for the contaminant.

For industrial land use scenarios, the VCP RG in soil is set to a target HQ of 1.0. This value is less conservative than the residential target, but still considered protective of industrial workers. The target organ-specific HI for the cumulative effects of multiple noncarcinogens is 1.0 for industrial land use. If more than one noncarcinogenic COPC is present for industrial land use scenarios, the participant should refer to Attachment E of this document, "Target Organs for Noncarcinogenic Effects of Various Contaminants." The number of contaminants affecting each target organ should be determined. If more than one COPC affects a single target organ or multiple target organs (thereby exceeding the target organ-specific HI of 1.0), NDEQ should be contacted to determine how to best adjust the VCP RGs so the 1.0 goal is met. As discussed earlier, if a participant decides to use the VCP RG for an industrial worker, the site should have an institutional control in place to ensure that future land uses remain only industrial. If a COPC is present but not listed in the VCP RG lookup tables (and not on the list presented in Attachment E), the participant should contact NDEQ to determine if target organ effects are applicable for the contaminant.

As with the target cancer risk discussed above, VCP RGs for direct contact exposure to groundwater will be identified consistent with the approach outlined in Title 118—Ground Water Standards and Use Classification—Appendix A (NDEQ 2006). The receptor is assumed an adult resident and a target HQ of 0.25 will be used for those compounds without Title 118 numerical standards. This HQ value will correspond to a concentration expected to result in no adverse health effect for longer-term or lifetime exposure, as discussed in Title 118, Appendix A. Absent a standard, however, VCP RGs are calculated in a manner similar to that for soils. This is discussed in more detail in Section 4.6.

4.4 SURFACE WATER

All surface water values for human exposure will be consistent with Title 117—Nebraska Surface Water Quality Standards, Chapter 4, Section 004—Water Supply (NDEQ 2014). Note that values protective of ecological receptors will be determined separately.

4.5 SOIL EXPOSURE

Multiple exposure pathways are considered when establishing a VCP RG for soil. VCP RGs for soil are based on three major pathways: incidental ingestion, dermal contact, and inhalation. The incidental

ingestion pathway assumes a higher incidental ingestion rate of soil for children than adults, and estimates protective concentrations in soil considering these ingestion rates combined with toxicity factors, risk levels/hazard indices, and other exposure factors (e.g., duration of exposure).

The dermal contact pathway takes into account receptor-specific contact rates and the same considerations used for incidental soil ingestion. In addition, chemical-specific absorption fractions and chemical-specific modifications of oral toxicity factors for dermally absorbed contaminant doses are used.

The soil inhalation pathway takes into account inhalation of COPCs volatilizing from the soils (volatile compounds only) or inhalation of airborne particulates or dusts. Chemical-specific volatilization factors from soil (VF_s) are used to estimate exposure from volatile COPCs. Volatiles are chemicals with a Henry's Law constant greater than or equal to 1×10^{-5} atm-m^3/mole or a vapor pressure greater than or equal to 1 mm Hg. For the purposes of the VCP direct contact RGs (Table A-1), only volatile organic compounds (VOC) are considered "volatile"; inorganics are not. To estimate the inhalation of particulates from nonvolatile COPCs, a particle emission factor (PEF) is used. U.S. EPA's "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites" (U.S. EPA 2002b) provides a procedure to calculate PEFs for various locations. To calculate a default PEF for Nebraska, specific data provided for Lincoln, Nebraska, were used.

As discussed earlier, the soil's saturation concentration is also calculated for each COPC. If the soil saturation concentration is lower than the above risk-based VCP RG, the saturation concentration is used as the VCP RG.

4.6 GROUNDWATER EXPOSURE

All direct contact groundwater exposure values are set consistent with Title 118—Ground Water Standards and Use Classification—Appendix A (NDEQ 2006), which establishes a groundwater classification process to protect groundwater for appropriate uses. For groundwater pollution occurrences, Title 118 identifies three remedial action classes (RACs): RAC-1, RAC-2, and RAC-3─defined in Appendix A as:

- RAC-1— This category includes groundwaters of Class GA and a portion of Class GB, a 500-foot radius around all private drinking water supply wells. In addition, RAC-1 shall be assigned automatically when a public or private drinking water supply well has been contaminated. RAC-1 shall receive the most extensive remedial action measures.

- RAC-2— This category includes groundwaters of Class GB (except for the portion of Class GB placed in RAC-1) and Class GC(R).

- RAC-3—This category includes, but is not limited to, groundwaters of Class GC, except for Class GC(R) that were placed in RAC-2. RAC-3 shall receive the least extensive remedial action measures.

Definitions of the groundwater classes GA, GB, and GC are provided in Chapter 7 of Title 118. Under Title 118, Appendix A, the VCP RGs for RAC-1 and RAC-2 are set at the maximum contaminant levels (MCLs) in Chapter 4. Absent an established MCL, U.S. EPA's Human Health Ambient Water Quality Criteria (U.S. EPA 2015a), Health Advisories (U.S. EPA 2012), and other documents are used to set the VCP RG.

For COPCs without a regulatory standard, the level is set at one of the following under Title 118: the concentration estimated to result in an excess lifetime cancer risk of 1×10^{-6}; a concentration expected to result in no adverse health effect for longer term or lifetime exposures; or a laboratory detection limit (if higher and within an acceptable range). For RAC-3, cleanup of readily removable contaminants (e.g., free product) is required, other impacts to beneficial use may be considered (e.g., wetland systems), and monitoring may also be necessary.

Note that the VCP RG protocol modifies the approach taken under Title 118, Appendix A. Instead of using only the ingestion pathway to determine the risk-based value, it also includes the inhalation pathway for volatile COPCs and uses an HQ of 0.25 for noncarcinogenic COPCs. Procedures to calculate this VCP RG follow those provided in the supporting documentation for U.S. EPA RSLs and are described in more detail in Section 6.6.

4.7 SOIL-TO-GROUNDWATER

Calculation of the VCP RGs for the soil contamination to groundwater exposure pathway assumes that contaminants are leached from the soil, migrate to the groundwater, and eventually enter a receptor well. For RAC-1 and RAC-2 sites, the receptor is assumed at the source area. For RAC-3 sites, the VCP RG should ensure no free product development on the groundwater table or no soil saturation.

The calculations follow the recommendations outlined in U.S. EPA's soil screening guidance (U.S. EPA 1996a, 1996b, and 2002b) and assume a target groundwater concentration of the MCL, if available, or the tap water VCP RG and a dilution attenuation factor (DAF) of 20. DAF represents the reduction in concentration that occurs as soil leachate moves through soil and groundwater, as a result of adsorption, degradation, and dilution by clean groundwater. DAF is defined as the ratio of soil leachate concentration to receptor point concentration. A DAF of 20, as used here, assumes a 20-fold reduction in contaminant concentration between the soil sampling location and the receptor well location. This DAF value is based

on the assumption of a 0.5-acre source and is applicable to most sites in the VCP program. In addition, a DAF of 20 is considered protective since NDEQ assumes the receptor to be at the source area, while in most cases actual receptors will be off site.

4.8 SOIL DEPTH

Soil VCP RGs for exposure through direct contact pathways apply to soil depths to which a receptor will likely be exposed at the site. For a residential receptor, this is the upper 10 feet—assumption being that potential basement construction may bring soil from this depth to the surface. For an industrial receptor, this is the upper 15 feet—assuming that construction or maintenance of a utility line could occur at this depth and exposure then would occur.

4.9 INDOOR AIR

Intrusion of volatile contaminants from the subsurface (either soil gas or groundwater) into buildings is a pathway of concern for NDEQ. To determine if remedial action may be required for this pathway, NDEQ has developed a specific protocol (Attachment D) to evaluate potential risks associated with this exposure pathway. This protocol is consistent with the U.S. EPA vapor intrusion guidance "Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway From Groundwater and Soils" (U.S. EPA 2015) and U.S. EPA's Vapor Intrusion Screening Level (VISL) Calculator (U.S. EPA 2017). Intrusion of volatile contaminants may be of concern at sites meeting the following criteria:

- Volatile COPCs (as defined in Section 4.5) are identified at the site
- Volatile COPCs are located 100 feet below ground level (bgl) or less
- Volatile COPCs are located in proximity to existing or future buildings (within 100 feet horizontally).

If these criteria are met, the participant should use Lookup Table A-2 to determine if the site could pose a risk to human health from vapor intrusion to indoor air.

5.0 READING THE VCP REMEDIATION GOAL LOOKUP TABLES

This section provides an overview of the VCP RG lookup tables. Since the approach taken to develop these tables was similar to the approach taken by U.S. EPA in developing the RSLs, large portions of the text in the following two sections are taken from the U.S. EPA RSL supporting documentation (U.S. EPA 2018b). The VCP RG lookup tables are presented in Attachment A to this Protocol (as well as Attachment 2-6 to the main VCP Guidance Document above) and the supporting tables are presented in Attachment B.

5.1 GENERAL CONSIDERATIONS

NDEQ requires calculation of both carcinogenic and noncarcinogenic VCP RGs; the lower (more protective) of the carcinogenic and noncarcinogenic VCP RG for each contaminant should then be used as the final value. For carcinogenic effects, risk is associated with the probability of an individual developing cancer over a lifetime. For noncarcinogenic effects, risk is expressed as a ratio (called the hazard quotient) of the expected exposure to the regulatory limit.

With the exceptions described below, VCP RGs are contaminant concentrations that correspond to fixed levels of risk and hazard in soil, soil gas, and groundwater—cancer risk of either 1×10^{-6} for residential or 1×10^{-5} for industrial, or a noncarcinogenic HQ of either 0.25 for residential or 1.0 for industrial. VCP RG concentrations that equate to the calculated cancer risk are indicated by "ca." VCP RG concentrations that equate to the calculated HQ for noncarcinogenic concerns are indicated by "nc." Note that for groundwater and soil-to-groundwater RGs, a “mcl” designation indicates that the value is based on a MCL from NDEQ Title 118.

In general, concentrations in the VCP RG lookup tables are risk-based, but two important exceptions for soil exist: (1) for some contaminants, VCP RGs are based on the soil saturation equation ("sat") and (2) for relatively less toxic inorganic and semi-volatile contaminants, a non-risk-based "ceiling limit" concentration is given as $1 \times 10^{+5}$ milligram per kilogram (mg/kg) ("max"). The risk-based values for these same contaminants are also available along with the VCP RGs if the participant wants to view the risk-based concentrations before applying “sat” or “max.” For more information on why the “sat” value and not a risk-based value is presented for several volatile contaminants in the VCP RG lookup tables, see Section 6.5.

Applying a “ceiling limit” to contaminants for reasons other than exceeding the saturation limit is not universally accepted. It has been argued that all values should be risk-based to allow for scaling (for example, if the risk-based VCP RG is set at HQ = 1.0, and the participant would like to set the HQ to 0.1 to

take into account multiple contaminants, this is as simple as multiplying the risk-based VCP RG by 1/10th). If scaling is necessary, VCP RG participants can make this adjustment by referring to the VCP RG lookup tables where risk-based soil concentrations are presented for all contaminants (see soil calculations, "combined" pathways column). Participants should contact NDEQ prior to conducting any scaling.

Though applying a ceiling limit is not universally accepted, NDEQ has opted to continue applying a "max" soil concentration to the VCP RG lookup tables for the following reasons:

- Risk-based VCP RGs for some contaminants in soil exceed unity (>1,000,000 mg/kg), which is not possible.
- The ceiling limit of $1 \times 10^{+5}$ mg/kg is equivalent to a contaminant representing 10% by weight of the soil sample. At this contaminant concentration (and higher), the assumptions for soil contact may not be accurate due to presence of the foreign contaminant itself (e.g., soil adherence, windborne dispersion may have changed).
- VCP RGs currently do not address short-term exposures (e.g., pica children [children who ingest unusually large amounts of non-food items, e.g., soil] and construction workers). Though extremely high soil VCP RGs are likely to represent relatively non-toxic contaminants, such high values might not be justified if more toxicological data were available for evaluating short-term and/or acute exposures. In other words, if more data regarding the acute toxicity of various compounds were available and considered, extremely high soil concentrations (e.g., $> 1 \times 10^{+5}$ mg/kg) may be found to be not protective. Therefore, application of the "max" soil concentration is intended to address this issue.

5.2 TOXICITY VALUES

Several issues impact toxicity values used to establish VCP RGs discussed in this section. A variety of sources are available for toxicity values, and this section identifies the toxicity source hierarchy used.

Hierarchy of Toxicity Values

In 2003, U.S. EPA's Superfund program revised its hierarchy of human health toxicity values, providing three tiers of toxicity values (U.S. EPA 2003). The toxicity values used in the VCP RG tables (see Table B-1 in Attachment B) are consistent with the 2003 guidance and the RSL tables (U.S. EPA 2018a). Toxicity values, known as noncarcinogenic RfDs and RfCs, and carcinogenic SFs and IURs, were obtained from the following hierarchy of sources:

1. U.S. EPA's Integrated Risk Information System (IRIS) (U.S. EPA 2018c).
2. The Provisional Peer Reviewed Toxicity Values (PPRTVs) derived by U.S. EPA's Superfund Health Risk Technical Support Center (STSC) for the U.S. EPA Superfund program (U.S. EPA 2018d).

3. The Human Health Benchmarks for Pesticides (HHBPs) derived by U.S. EPA's Office of Pesticide Programs (OPP). IRIS has archived 51 chemical assessments for pesticides and has recommended the use of the toxicity values presented in the HHBP table (U.S. EPA 2018c).

4. The Agency for Toxic Substances and Disease Registry (ATSDR) minimal risk levels (MRLs) (ATSDR 2017).

5. The California Environmental Protection Agency Office of Environmental Health Hazard Assessment's Chronic Reference Exposure Levels (RELS) and the Cancer Potency Values (CalEPA 2018).

6. Screening toxicity values in an appendix to certain PPRTV assessments (U.S. EPA 2018d).

7. The U.S. EPA Superfund program's Health Effects Assessment Summary Table (U.S. EPA 2011a).

Toxicity values for perfluorooctanesulfonate (PFOS) and perfluorooctanoic acid (PFOA) are based on U.S. EPA Office of Water values (U.S. EPA 2016a, 2016b) and the U.S. National Library of Medicine ChemID*plus* database (NIH 2017).

Inhalation Toxicity Factors

Consistent with current U.S. EPA methodology, the VCP RG inhalation equations use RfCs and IURs instead of inhalation RfDs and SFs. Due to the uncertainties involved in making the surface area and/or pharmacokinetic adjustments required to estimate an internal dose (e.g., inhalation RfD), and considering possible route-of-entry effects of various contaminants, route-to-route extrapolations are not performed for the toxicity factors in the VCP RG lookup tables. Therefore, the VCP RG lookup tables do not contain any inhalation values obtained using route-to-route extrapolation methods.

Dermal Toxicity Factors

Consistent with current U.S. EPA methodology, the VCP RG dermal equations use modified toxicity values to assess dermal risk. The approach taken to modify the toxicity factors for dermal exposure was consistent with U.S. EPA guidance (U.S. EPA 2004, 2018b).

Mutagens

Some of the cancer causing analytes in the lookup tables operate by a mutagenic mode of action for carcinogenesis. There is reason to surmise that some chemicals with a mutagenic mode of action, which would be expected to cause irreversible changes to DNA, would exhibit a greater effect in early-life versus later-life exposure. Cancer risk to children in the context of the U.S. Environmental Protection Agency's

cancer guidelines (U.S. EPA 2005) includes both early-life exposures that may result in the occurrence of cancer during childhood and early-life exposures that may contribute to cancers later in life. In keeping with this guidance, separate cancer risk equations are presented for mutagens. The following compounds included in the lookup tables are identified as mutagens: acrylamide, benzidine, hexavalent chromium, coke oven emissions, 1,2-dibromo-3-chloropropane, ethylene oxide, methylene chloride, N-nitrosodiethylamine, N-nitrosodimethylamine, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene, and 1,2,3-trichloropropane. In addition, the mutagens trichloroethylene (TCE) and vinyl chloride each have unique sets of equations for the calculation of VCP RGs (see section 5.4).

5.3 CHEMICAL/PHYSICAL PARAMETERS

Chemical/physical parameters used to calculate the VCP RGs are presented in Attachment B, Table B-2 and were taken directly from the chemical/physical properties table listed in the U.S. EPA RSL table (EPA 2018a), except for perfluorooctanesulfonate (PFOS) and perfluorooctanoic acid (PFOA), which are based on literature values from several sources noted in the table footnotes.

5.4 VCP REMEDIATION GOALS DERIVED WITH SPECIAL CONSIDERATIONS

Most VCP RGs are readily derived via the various equations contained herein. However, for some contaminants the standard equations do not apply and/or adjustments to the toxicity values are recommended. These special case contaminants are discussed below. Note that each of these special considerations, with the exception of ammonia, is consistent with the approaches taken by U.S. EPA RSL table (U.S. EPA 2018a) and the User Guide (U.S. EPA 2018b). Ammonia is considered here based on information derived from consultation with other NDEQ programs.

Ammonia

Ammonia use as a fertilizer is common in Nebraska. In the subsurface, ammonia is generally converted to nitrites via biological oxidation, and then to nitrates in the chemical nitrification process. No MCL has been established for ammonia. As established by Nebraska Title 118, the MCL for nitrite (as N) is 1 mg/L and for nitrate is 10 mg/L. By NDEQ policy decision, the VCP RG for ammonia in groundwater is provided as 10,000 µg/L (10 mg/L) total combined ammonia (as N), nitrite (as N), and nitrate (as N). For the migration to groundwater exposure pathway, the soil RG for ammonia is provided as 40 mg/kg (parts per million) combined ammonia/nitrite/nitrate.

Arsenic

Consistent with the U.S. EPA RSLs (U.S. EPA 2018a), arsenic VCP RGs for ingestion of soil are calculated with a relative bioavailability factor (RBA) of 0.6. The RBA can be adjusted for site-specific conditions if supported by a bioavailability study and a Tier III HHRA is performed.

Cadmium

The VCP RGs for cadmium are based on the oral RfD for water for exposure to that medium and the RfD for food for exposure to soil. This is consistent with current U.S. EPA guidance (U.S. EPA 2018a). IRIS presents an oral "water" RfD for cadmium for use in assessment of risks to water of 0.0005 mg/kg-day. IRIS also presents an oral "food" RfD for cadmium for use in assessment of risks to soil and biota of 0.001 mg/kg-day.

Chromium VI

Valence-specific data for chromium should be collected whenever possible when chromium is likely to be a contaminant at a site based on site history, and when hexavalent chromium (chromium VI) may exist. For chromium VI, IRIS (U.S. EPA 2018c) shows an IUR of 1.2E-2 per $\mu g/m^3$. While the exact ratio of chromium VI to trivalent chromium (chromium III) in the data used to derive the IRIS IUR value is not known, it is likely that both forms of chromium were present. The RSLs and VCP RGs, calculated using the IRIS IUR, assume that the chromium VI to chromium III ratio is 1:6. Because of various sources of uncertainty, this assumption may overestimate or underestimate the risk calculated. Users are invited to review the document "Toxicological Review of Hexavalent Chromium" in support of the summary information on chromium VI on IRIS (U.S. EPA 2018c) to determine whether they believe this ratio applies to their site and to consider consulting with an U.S. EPA regional risk assessor. The uncertainty section of the risk assessment may want to address the potential for overestimating or underestimating the risk and provide quantitative analysis by deriving different IUR values based on different chromium VI to chromium III ratios from more recent studies.

In the VCP RGs table, the chromium VI specific value assuming 100% chromium VI is derived by multiplying the IRIS chromium VI value by 7. This is considered to be a health-protective assumption, and is also consistent with the State of California's basis for their estimated cancer potency of chromium VI (Cal EPA 2018).

There is uncertainty associated with the carcinogenic assessment of hexavalent chromium, particularly regarding whether it has a mutagenic mode of action for carcinogenesis (U.S. EPA 2018a). However, no

updated consensus IRIS assessment has yet appeared, and chromium is still under review by the IRIS program. With respect to VCP RGs, and consistent with the U.S. EPA RSLs (U.S. EPA 2018a), the more health-protective approach of applying age dependent adjustment factors (ADAF) for early life exposure via ingestion, dermal and inhalation was used to calculate screening levels for all exposure pathways. Application of ADAFs for all exposure pathways results in more health-protective screening levels.

Lead

U.S. EPA has no consensus RfD or SF for inorganic lead, so it is not possible to calculate VCP RGs using the same methods as for other chemicals. U.S. EPA considers lead to be a special case because of the difficulty in identifying the classic "threshold" needed to develop a RfD. U.S. EPA therefore evaluates lead exposure by using blood-lead modeling.

Derivations of residential VCP RGs for lead are based on pharmacokinetic models. U.S. EPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model is designed to predict the probable blood lead concentrations for children 0 to 84 months old who have been exposed to lead through various sources (air, water, soil, dust, diet and *in utero* contributions from the mother) (U.S. EPA 1994, 2007, 2010). Run in reverse, this model also allows calculation of lead VCP RGs considered "acceptable" by U.S. EPA.

For the purposes of screening, 400 mg/kg is considered acceptable for residential soils. For water, the U.S. EPA Action Level in tap water (and Nebraska Title 118 MCL) of 15 µg/L is used as the groundwater direct contact RG, and for air, the National Ambient Air Quality Standard of 0.15 $\mu g/m^3$.

A VCP RG of 800 mg/kg has been calculated for lead in soil at commercial/industrial sites. U.S. EPA uses the Adult Lead Model to estimate screening levels for industrial settings. This lead RSL is intended to protect a fetus that may be carried by a pregnant female worker. It is assumed that a cleanup goal that is protective of a fetus will also afford protection for male or female adult workers. The model equations were developed to calculate cleanup goals such that the fetus of a pregnant female worker would not likely have an unsafe concentration of lead in blood.

However, caution should be used when both water and soil are being assessed. The IEUBK model shows that if the average soil concentration is 400 mg/kg, an average tap water concentration above 5 µg/L would yield more than 5% of the population above a 10 micrograms per deciliter (µg/dL) blood-lead level. If the average tap water concentration is 15 µg/L, an average soil concentration greater than 250 mg/kg would yield more than 5% of the population above a 10 µg/dL blood-lead level, which is considered to be an unacceptable level.

U.S. EPA currently recommends basing lead modeling on a target blood lead concentration of 10 µg/dL (U.S. EPA 2009b, 2010, 2015c). This target level is referred to as a "blood level of concern" and was used to develop U.S. EPA's industrial soil RSLs for lead (U.S. EPA 2018a). However, the Centers for Disease Control and Prevention (CDC) now recommend a target blood lead concentration of 5 µg/dL (CDC 2012). This reference value was identified by the CDC as the concentration to use in identifying children with elevated blood lead levels (CDC 2012). It is important to realize that the 5 µg/dL is not based on a direct measurement of adverse health effects. Rather, it is the 97.5th percentile of the National Health and Nutrition Examination Survey (NHANES)-generated blood lead level distribution in children 1 to 5 years old. However, numerous studies show that lead causes adverse health effects below a 5 µg/dL blood lead level. The reduced blood lead level has been adopted by several states in calculating their lead soil preliminary remediation goals (PRG). Clearly, a reduction in the target blood lead level would result in corresponding reductions in the receptor-specific lead soil PRGs.

In a memorandum dated December 22, 2016, and titled, "Updated Scientific Considerations for Lead in Soil Cleanups," U.S. EPA makes a series of recommendations regarding lead exposure (U.S. EPA 2016c). Portions of those recommendations specific to the determination of a site-specific cleanup level for lead in soil are presented below:

1. "Within the framework of existing policy, consider current scientific conclusions in conjunction with the Integrated Exposure Uptake and Biokinetic (IEUBK) model to determine soil screening levels for residential cleanups. Similarly, Regions should continue to use the most current version of the Adult Lead Methodology (ALM) to determine soil screening levels for commercial and industrial cleanups."

2. "Site-specific information is generally used to determine [preliminary remediation goals] PRGs and cleanup levels. In particular, Regions should evaluate the site-specific bioavailability of lead using the U.S. EPA's in-vitro bioaccessibility assay for lead (see: https://www.epa.gov/hw-sw846/validated-test-method-1340-vitro-bioaccessibility-assay-lead-soil) when determining cleanup levels."

3. On a site-specific basis, Regions may wish to vary some of the internal IEUBK model parameters (e.g., ingestion rate or mass soil to dust) based on peer-reviewed literature or site-specific studies.

Consistent with the December 2016 memorandum, U.S. EPA is considering changes to some of the modeling inputs identified above. In addition to possibly modifying the target blood lead level, U.S. EPA is also considering changes to PbB_o (baseline blood lead levels) and geometric standard deviation (GSD). Changes in these inputs may result in revised default residential and industrial/commercial lead soil RSLs. Based on preliminary indications, the industrial lead soil PRG may increase to about 1,200 mg/kg and the residential lead soil PRG could drop to about 200 mg/kg.

Manganese

The IRIS RfD (0.14 mg/kg-day) includes manganese from all sources, including diet. The author of the IRIS assessment for manganese recommends subtracting the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) when evaluating non-food (e.g., drinking water or soil) exposures to manganese, leading to an RfD of 0.071 mg/kg-day for non-food items. The explanatory text in IRIS further recommends using a modifying factor of 3 when calculating hazards associated with non-food sources due to a number of uncertainties discussed in the IRIS file for manganese, leading to a RfD of 0.024 mg/kg-day. This modified RfD is applied in the derivation of the VCP RGs for soil and groundwater.

Trichloroethylene (TCE)

The IRIS (U.S. EPA 2011b) toxicological review for TCE suggests that kidney risk be assessed using the mutagenic equations and liver and non-Hodgkin lymphoma (NHL) risk be addressed using the standard cancer equations. To generate cancer risk estimates for multiple age receptors, such as residential, the risk calculations for TCE were performed for both mutagenic mode of action (kidney) and regular cancer end-points (liver and NHL), the standard cancer and mutagen equations need to be combined. To accomplish combining of the cancer and mutagen equations U.S. EPA (2018b) calculated toxicity value adjustment factors for cancer (CAF) and mutagens (MAF), which are then incorporated into modified cancer risk equations. The adjustment factors are based on the adult-based toxicity values and are a ratio of the SF or IUR based on either the cancer endpoint or mutagenic endpoint and the generic adult cancer toxicity values presented in the VCP RG tables. The adjustments were calculated for both oral and inhalation pathways.

The mutagenic calculation incorporates the ADAFs specific to the mutagenic (kidney) endpoint. For receptors evaluated for only adults, such as workers, the cancer toxicity values account for all potential cancer endpoints. Therefore, the standard cancer risk calculation can be used and adjustment of the toxicity values is not necessary. The oral cancer adjustment factor (CAFo) is 0.804, while the inhalation cancer adjustment factor (CAFi) is 0.756. The oral mutagenic adjustment factor (MAFo) is 0.202, while the inhalation mutagenic adjustment factor (MAFi) is 0.244. The VCP RGs utilized the TCE equations presented in the RSL user guide (U.S. EPA 2018b).

The latest human health toxicity information on TCE published by U.S. EPA (2011b) identified potentially significant risks from less-than-lifetime exposures to TCE. It found that exposure to TCE within a window of susceptibility during pregnancy resulted in development toxicity. Short-term exposures to TCE during pregnancy are associated with many forms of developmental toxicity; however, the critical development

endpoint is cardiac malformations. The primary types of defects observed with TCE exposures include the development of holes in the wall between the top two chambers in the heart. The critical window of susceptibility for these types of defects is an approximate three-week period approximately four to seven weeks after conception (U.S. EPA 2016c). Given this information, U.S. EPA Region 7 has developed air action levels for both residential and industrial/commercial exposures to TCE (EPA 2016). The residential levels assume 24-hours per day exposures and the industrial/commercial levels assume an 8-hour per day exposure. The Region 7 action levels are – 2 $\mu g/m^3$ for residential exposures and 6 $\mu g/m^3$ for industrial/commercial exposures. These target air values were also used to calculate the groundwater and subslab and exterior soil gas concentrations for the vapor intrusion pathway. The full text supporting these values is provided in Attachment F.

Vanadium and compounds

The oral RfD toxicity value for vanadium, used in calculating the VCP RG, is derived from the IRIS oral RfD for vanadium pentoxide by factoring out the molecular weight (MW) of the oxide ion. Vanadium pentoxide has a molecular weight of 181.88. The two atoms of vanadium contribute 56% of the MW. Vanadium pentoxide's oral RfD of 9E-03 multiplied by 56% gives a vanadium oral RfD of 5.04E-03 (U.S. EPA 2018b).

Vinyl Chloride

Vinyl chloride has a unique mode of toxicity and thus has a unique set of equations for receptors such as residents that include early-life exposure. Cancer risk to children in the context of U.S. EPA's cancer guidelines (U.S. EPA 2005) includes both early-life exposures that may result in the occurrence of cancer during childhood and early-life exposures that may contribute to cancers later in life. In keeping with this guidance, separate cancer risk equations are presented for mutagens. Vinyl chloride is handled differently from other chemicals because of the unique aspects of its slope factor derivation. The IRIS (U.S. EPA 2000) toxicological review for vinyl chloride provides two slope factors are for this chemical, one that accounts for exposure occurring during early life and one that accounts for exposure occurring later in life. Specifically, for exposures beginning at birth an additional twofold safety factor is recommended in the toxicological review (U.S. EPA 2000). U.S. EPA considers it to be an appropriate way to deal with vinyl chloride's special ability to increase the lifetime cancer risk when exposure occurs during an undefined period of development in early life when the infant or child is particularly vulnerable to the chemical. This specific risk appears to be independent of, and in additive to, the more traditionally defined risk that is believed to be directly relative to exposure duration and frequency. For these reasons, the equations for

vinyl chloride are unique. The VCP RGs utilized the vinyl chloride equations presented in the RSL user guide (U.S. EPA 2018b).

5.5 SOIL-TO-GROUNDWATER APPROACH

The soil-to-groundwater RGs were developed using a default DAF of 20 to account for natural processes that reduce contaminant concentrations in the subsurface. The calculations follow the recommendations outlined in U.S. EPA's soil screening guidance (U.S. EPA 1996a, 1996b, and 2002b) and assume a target groundwater concentration of the MCL, if available, or the tap water VCP RG. In general, if VCP RGs are not exceeded for the migration to groundwater pathway, this pathway may be eliminated from further investigation.

5.6 MISCELLANEOUS

Volatility is defined in Section 4.5 of this document. A volatile contaminant is indicated by a "1" in the VOL column of supplemental information Table B-2 of this document. VOCs are evaluated for potential volatilization from soil and water to air but not for dermal exposure to soil per U.S. EPA guidance (2004, 2018b). Chemical-specific dermal absorption values for contaminants in soil and dust are as recommended in the Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment (U.S. EPA 2004) and consistent with the RSLs (U.S. EPA 2018a).

6.0 TECHNICAL SUPPORT DOCUMENTATION

VCP RGs are chemical- and media-specific goals for soil, soil gas, and groundwater that are designed to be protective of human health and the environment. The following section describes the approach taken to calculate exposures to soils via incidental ingestion, dermal contact, inhalation, soil to groundwater; and exposures to groundwater via ingestion and inhalation. The results of the calculations for each pathway are presented in Attachment B, Tables B-3 through B-5. The approach taken to calculate potential exposure to vapors in indoor air via the intrusion of contaminant vapors from soil gas and groundwater are described in Attachment D.

6.1 SOILS - INCIDENTAL INGESTION

Calculation of risk-based VCP RGs for incidental ingestion of soil is based on methods presented in RAGS (U.S. EPA 1991a) and soil screening guidance (U.S. EPA 1996a, 1996b, 2002b). Briefly, these methods involve calculating a soil concentration (i.e., a RG) of a contaminant that is associated with a selected target cancer risk or, for adverse noncarcinogenic effects, the selected Hazard Index.

A number of studies have shown that inadvertent ingestion of soil is common among children six years old and younger (Calabrese and others 1989; Davis and others 1990; Van Wijnen, Clausing, and Brunekreef 1990). To take into account the higher soil intake rate for children, two different approaches are used to estimate soil VCP RGs, depending on whether the adverse health effect is cancer or some effect other than cancer. For carcinogens, the method for calculating soil VCP RGs uses an age-adjusted soil ingestion factor that considers the difference in daily soil ingestion rates, body weights, and exposure duration for children from 0 to 6 years old and for individuals from 7 to 26 years old. This health-protective approach is chosen to take into account the higher daily rates of soil ingestion in children, as well as the longer duration of exposure anticipated for a long-term resident. For more on this method, see RAGS (U.S. EPA 1991a).

For the assessment of noncarcinogenic effects, childhood exposure is evaluated separately from adult exposure. An age-adjustment factor is not applied as is done when assessing carcinogenic risks. This approach is considered conservative because it combines the higher 6-year exposure for children with chronic toxicity criteria. NDEQ has adopted this approach for calculating soil VCP RGs for noncarcinogenic health concerns.

6.2 SOILS - VAPOR AND PARTICULATE INHALATION

U.S. EPA toxicity criteria indicate that risk from exposure to some contaminants via inhalation far outweigh the risk via incidental ingestion; therefore, soil VCP RGs have been designed to address this pathway as well. The models used to calculate VCP RGs for inhalation of volatiles and particulates are updates of risk assessment methods presented in RAGS: Part B (U.S. EPA 1991a) and are identical to the Soil Screening Guidance: Technical Background Document and User's Guide (U.S. EPA 1996a, 1996b).

Note that the soil-to-air pathway evaluated in the VCP RG calculations is based on direct inhalation exposure that results from volatilization or particulate emissions of contaminants from soil to outdoor air. The soil VCP RG calculations currently do not evaluate the potential for volatile contaminants in soil to migrate indoors.

To address the soil-to-outdoor air pathways, the VCP RG calculations incorporate a volatilization factor for soil (VF_s) for volatile contaminants and particulate emission factor (PEF) for nonvolatile contaminants. These factors relate soil contaminant concentrations to air contaminant concentrations that may be inhaled on site. The VF_s and PEF equations can be divided into two separate models: an emission model to estimate emissions of the contaminant from the soil and a dispersion model to simulate the dispersion of the contaminant in the atmosphere.

The dispersion model for both volatiles and particulates is the AREA-ST, an updated version of the Office of Air Quality Planning and Standards, Industrial Source Complex Model, ISC2. For the VCP RGs, the Q/C term of 81.64 g/m^2-sec/kg/m^3 for Lincoln, Nebraska, was used for both the VF_s and PEF equations. A default source size of 0.5 acre was chosen for the VCP RG calculations. For unusual site conditions of an area source substantially larger than the default source area assumed here, an alternative Q/C can be applied (see U.S. EPA 1996a, 1996b).

Volatilization Factor for Soils

VOCs were screened for inhalation exposure using chemical-specific, calculated VF_s values. VF_s values are provided in Attachment B, Table B-2 and are consistent with the values in the RSL tables (U.S. EPA 2018a). The emission terms used in the VF_s calculations are chemical-specific and were calculated from physical-chemical parameters obtained from the U.S. EPA RSL tables (U.S. EPA 2018a).

The VF_s equation described herein forms the basis for deriving generic soil VCP RGs for the inhalation pathway. The following parameters in the standardized equation can be replaced with site-specific data to develop a simple site-specific VCP RG:

- Source area
- Average soil moisture content
- Average fraction organic carbon content
- Dry soil bulk density.

The basic principle of the VF_s model (Henry's Law) is applicable only if the soil contaminant concentration is at or below soil saturation ("sat"). Above the soil saturation limit, the model cannot predict an accurate VF_s-based VCP RG. How these particular cases are handled depends on whether the contaminant is liquid or solid at ambient soil temperatures (see Section 6.5).

Note that soil inhalation VCP RGs are not calculated for inorganics, even if they fit the volatility cutoffs (H >1E-05 atm-m^3/mole).

Particulate Emission Factor for Soils

Inhalation of contaminants adsorbed to respirable particles (PM_{10}) were assessed using a default PEF equal to 2.0E+9 m^3/kg that relates the contaminant concentration in soil with the concentration of respirable particles in the air due to fugitive dust emissions from contaminated soils. The PEF for the VCP RGs was derived using input values based on Lincoln, NE. The relationship is derived by Cowherd and others (1985) for a rapid assessment procedure applicable to a typical hazardous waste site where the surface contamination provides a relatively continuous and constant potential for emission over an extended period of time (e.g., years). This represents an annual average emission rate based on wind erosion that should be compared with chronic health criteria; it is not appropriate for evaluating the potential for more acute exposures. Note that the default PEF evaluates windborne emissions and does not consider dust emissions from traffic or other forms of mechanical disturbance that could lead to greater emissions than assumed here. For more details regarding specific parameters used in the PEF model, the reader is referred to Soil Screening Guidance: Technical Background Document (U.S. EPA 1996a).

6.3 SOILS - DERMAL EXPOSURE

Dermal Contact Assumptions

Exposure factors for dermal contact with soil are based on recommendations in Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual ("Part E, Supplemental Guidance for Dermal Risk Assessment") (U.S. EPA 2004) or as updated in the 2014 OSWER Directive: Update of Standard Default Exposure Factors (U.S. EPA 2014) and are consistent with the clause used in the U.S. EPA RSLs (U.S. EPA 2018a).

Dermal Absorption

Chemical-specific dermal absorption factors recommended by the Superfund Dermal Workgroup (U.S. EPA 2004) were applied when available. The dermal absorption factors (ABS_d) are used to estimate the percentage of applied chemical that will absorbed across the skin barrier to calculate a dermal dose. Chemical-specific values recommended in the U.S. EPA RSLs are included in the VCP RG dermal calculations.

6.4 SOILS - MIGRATION TO GROUNDWATER

VCP RGs were developed for soil contaminants that have the potential to contaminate underlying groundwater. Migration of contaminants from soil to groundwater can be envisioned as a two-stage process: (1) release of contaminant in soil leachate and (2) transport of the contaminant through the underlying soil and aquifer to a receptor well. The soil-to-groundwater VCP RG methodology considers both of these fate and transport mechanisms.

Soil-to-groundwater VCP RGs are back-calculated from acceptable groundwater concentrations (i.e., MCLs per Title 118, or risk-based VCP RGs for the remaining compounds). First, the target groundwater concentration is multiplied by a dilution factor to obtain a target leachate concentration. For example, if the dilution factor is 20 and the target groundwater concentration is 0.05 mg/L, the target soil leachate concentration would be 1.0 mg/L. The partition equation presented herein is then used to calculate the total soil concentration (i.e., VCP RG) corresponding to this soil leachate concentration.

The soil-to-groundwater VCP RG methodology was designed for use during the early stages of a site evaluation when information about subsurface conditions may be limited. Because of this constraint, the methodology is based on conservative, simplifying assumptions about the release and transport of contaminants in the subsurface. For further information, the reader is referred to the Soil Screening Guidance documents (U.S. EPA 1996a, 1996b, and 2002b).

6.5 SOIL SATURATION LIMIT

The soil saturation concentration ("sat") corresponds to the contaminant concentration in soil at which the absorptive limits of the soil particles, the solubility limits of the soil pore water, and saturation of soil pore air have been reached. Above this concentration, the soil contaminant may be present in free phase, i.e., nonaqueous phase liquids (NAPLs), for contaminants that are liquid at ambient soil temperatures and pure solid phases for compounds that are solid at ambient soil temperatures. The "sat" equation included herein is used to calculate "sat" for each volatile contaminant. This equation takes into account the amount of contaminant that is in the vapor phase in soil in addition to the amount dissolved in the soil's pore water and sorbed to soil particles.

Chemical-specific "sat" concentrations should be compared with each VF_s-based VCP RG because a basic principle of the VCP RG volatilization model is not applicable when free-phase contaminants are present. How these cases are handled depends on whether the contaminant is liquid or solid at ambient temperatures. Note that contaminants that are solids at ambient temperatures are indicated in the VCP RG lookup tables. Liquid contaminants with a VF_s-based VCP RG that exceeds the "sat" concentration are set equal to "sat," whereas for solids (e.g., PAHs), soil screening decisions are based on the appropriate VCP RGs for other pathways of concern at the site (e.g., incidental ingestion).

6.6 GROUNDWATER—INGESTION AND INHALATION

Calculation of VCP RGs for ingestion and inhalation of contaminants in domestic water is based on the methodology presented in RAGS Part B (U.S. EPA 1991a). Ingestion of drinking water is an appropriate pathway for all contaminants. For the purposes of this guidance, however, inhalation of volatile chemicals from water is considered routinely only for those contaminants defined as volatiles (see Section 4.5). For volatile contaminants, the default volatilization factor (VF_w) of 0.5 is used that is based on all uses of household water (e.g., showering, laundering, and dish washing).

6.7 DEFAULT EXPOSURE FACTORS

Default exposure factors were obtained primarily from RAGS (U.S. EPA 1991b), and more recent information from U.S. EPA's Office of Solid Waste and Emergency Response (OSWER) (U.S. EPA 2014). Default values are identified in Attachment C, Table C-1. Because contact rates may differ for children and adults, carcinogenic risks for the resident during the first 26 years of life were calculated using age-adjusted factors ("adj"). Use of age-adjusted factors is especially important for soil ingestion exposures,

which are higher during childhood and decrease with age. Age-adjusted factors were obtained from U.S. EPA RSLs (U.S. EPA 2018a) or developed by analogy.

Noncarcinogenic contaminants are evaluated in children separately from adults. No age-adjustment factor is used in this case. The focus on children is considered protective because of the higher daily intake rates of soil and groundwater by children and their lower body weights.

The standardized equations used to calculate the VCP RGs are described in detail in Attachment C. U.S. EPA default exposure factors (U.S. EPA 1991b, 2014) were used except the following exposure factors are State of Nebraska-specific values:

- Skin Surface area – 2,690 cm^2 for worker
- Soil Adherence factor – 0.2 mg/cm^2 for worker

These assumptions result in slightly more protective VCP RGs for the worker than the comparable RSLs (U.S. EPA 2018a).

7.0 SUMMARY

This document describes the protocol followed to develop VCP RGs. The protocol provides an adequate level of protection to residential and industrial worker populations. Where possible, the values are specific to Nebraska through the use of, for example, Title 118 for groundwater values and Nebraska-specific PEFs.

Groundwater VCP RGs are based on Nebraska Title 118—Ground Water Quality Standards, if available, and considers exposure to residents, both adult and child. In addition, exposure to volatile COPCs in groundwater via the vapor intrusion pathway are considered for both the residents (children and adults) and industrial/commercial workers. VCP RGs for soil are based on three major pathways: incidental ingestion, dermal contact, and inhalation for both the residents (children and adults) and industrial/commercial workers. Finally, exposure to volatile COPCs in soil gas via the vapor intrusion pathway are considered for both the residents (children and adults) and industrial/commercial workers. Age-adjusted intake factors were used to calculate exposure to residents (children and adults) and mutagenic-adjusted intake were used for carcinogenic chemicals identified as having a mutagenic mode of action. Chemical-specific cancer risk equations were used for TCE and vinyl chloride.

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ATTACHMENT A

VCP REMEDIATION GOALS LOOKUP TABLES

Table A-1: Groundwater & Soil Remediation Goals (Direct Contact Exposure Pathways)

Table A-2: Indoor Air, Soil Gas & Groundwater Vapor Intrusion Remediation Goals

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Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE A-1: GROUNDWATER AND SOIL REMEDIATION GOALS

Version Date: September 2018

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Acephate	30560-19-1	6.0E+00	nc	1.9E+01	nc	9.1E+02	nc	2.6E-02	nc
Acetaldehyde	75-07-0	2.6E+00	ca	1.1E+01	ca	3.4E+02	nc	1.0E-02	ca
Acetochlor	34256-82-1	8.8E+01	nc	3.2E+02	nc	1.5E+04	nc	1.4E+00	nc
Acetone	67-64-1	3.5E+03	nc	1.5E+04	nc	1.0E+05	max	1.4E+01	nc
Acetone cyanohydrin	75-86-5	--		1.0E+05	max	1.0E+05	max	--	
Acetonitrile	75-05-8	3.1E+01	nc	2.0E+02	nc	3.4E+03	nc	1.3E-01	nc
Acrolein	107-02-8	1.0E-02	nc	3.6E-02	nc	6.0E-01	nc	4.2E-05	nc
Acrylamide	79-06-1	5.0E-02	ca	2.4E-01	ca	4.3E+01	ca	2.1E-04	ca
Acrylic acid	79-10-7	5.2E-01	nc	2.5E+01	nc	4.2E+02	nc	2.1E-03	nc
Acrylonitrile	107-13-1	5.2E-02	ca	2.5E-01	ca	1.1E+01	ca	2.3E-04	ca
Alachlor	15972-60-8	2.0E+00	mcl	9.7E+00	ca	3.8E+02	ca	3.3E-02	mcl
Aldicarb	116-06-3	3.0E+00	mcl	1.6E+01	nc	7.6E+02	nc	1.5E-02	mcl
Aldicarb sulfone	1646-88-4	2.0E+00	mcl	1.6E+01	nc	7.6E+02	nc	8.8E-03	mcl
Aldrin	309-00-2	9.2E-04	ca	3.9E-02	ca	1.8E+00	ca	3.0E-03	ca
Allyl alcohol	107-18-6	5.2E-02	nc	8.8E-01	nc	1.5E+01	nc	2.1E-04	nc
Allyl chloride	107-05-1	5.2E-01	nc	4.1E-01	nc	6.9E+00	nc	3.3E-03	nc
Aluminum	7429-90-5	5.0E+01	mcl	1.9E+04	nc	1.0E+05	max	1.5E+03	mcl
Aluminum phosphide	20859-73-8	2.0E+00	nc	7.8E+00	nc	4.7E+02	nc	--	
Ametryn	834-12-8	3.8E+01	nc	1.4E+02	nc	6.8E+03	nc	8.0E-01	nc
m-Aminophenol	591-27-5	4.0E+02	nc	1.3E+03	nc	6.1E+04	nc	3.0E+00	nc
Amitraz	33089-61-1	2.0E+00	nc	4.0E+01	nc	1.9E+03	nc	2.1E+01	nc
Ammonia +++	7664-41-7	1.0E+04	NDEQ	1.0E+05	max	1.0E+05	max	4.0E+01	NDEQ
Ammonium sulfamate	7773-06-0	1.0E+03	nc	3.9E+03	nc	1.0E+05	max	--	
Aniline	62-53-3	1.3E+01	ca	9.5E+01	ca	3.7E+03	ca	9.1E-02	ca
Antimony and compounds	7440-36-0	6.0E+00	mcl	7.8E+00	nc	4.7E+02	nc	5.4E+00	mcl
Antimony pentoxide	1314-60-9	2.4E+00	nc	9.8E+00	nc	5.8E+02	nc	--	
Antimony potassium tartrate	28300-74-5	6.0E+00	mcl	1.8E+01	nc	1.1E+03	nc	--	
Antimony tetroxide	1332-81-6	1.9E+00	nc	7.8E+00	nc	4.7E+02	nc	--	
Antimony trioxide	1309-64-4	--		1.0E+05	max	1.0E+05	max	--	
Arsenic (inorganic) +++	7440-38-2	1.0E+01	mcl	4.6E-01	ca	2.2E+01	ca	--	
Arsine	7784-42-1	1.7E-02	nc	6.8E-02	nc	4.1E+00	nc	--	
Assure	76578-14-8	3.1E+01	nc	1.4E+02	nc	6.8E+03	nc	9.6E+00	nc
Asulam	3337-71-1	1.8E+02	nc	5.7E+02	nc	2.7E+04	nc	9.2E-01	nc
Atrazine	1912-24-9	3.0E+00	mcl	2.4E+00	ca	9.2E+01	ca	3.9E-02	mcl
Avermectin B1	65195-55-3	3.5E-01	s	6.3E+00	nc	3.0E+02	nc	7.0E+01	nc
Azobenzene	103-33-3	1.2E-01	ca	5.6E+00	ca	2.6E+02	ca	1.9E-02	ca

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE A-1: GROUNDWATER AND SOIL REMEDIATION GOALS

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Barium and compounds	7440-39-3	2.0E+03	mcl	3.9E+03	nc	1.0E+05	max	1.6E+03	mcl
Benfluralin (Benefin)	1861-40-1	7.1E+00	nc	9.8E+01	nc	5.8E+03	nc	4.7E+00	nc
Bensulfuron-methyl (Londax)	83055-99-6	9.9E+02	nc	3.2E+03	nc	1.0E+05	max	5.0E+00	nc
Bentazone (Bentazon)	25057-89-0	1.4E+02	nc	4.7E+02	nc	2.3E+04	nc	6.2E-01	nc
Benzaldehyde	100-52-7	1.9E+01	ca	1.7E+02	ca	8.2E+03	ca	8.3E-02	ca
Benzene	71-43-2	5.0E+00	mcl	1.2E+00	ca	5.1E+01	ca	5.1E-02	mcl
Benzidine	92-87-5	1.1E-04	ca	5.3E-04	ca	9.2E-02	ca	5.5E-06	ca
Benzoic acid	65-85-0	1.9E+04	nc	6.3E+04	nc	1.0E+05	max	7.6E+01	nc
Benzotrichloride	98-07-7	3.0E-03	ca	5.3E-02	ca	2.5E+00	ca	1.3E-04	ca
Benzyl alcohol	100-51-6	4.9E+02	nc	1.6E+03	nc	7.6E+04	nc	2.4E+00	nc
Benzyl chloride	100-44-7	8.9E-02	ca	1.1E+00	ca	4.8E+01	ca	2.0E-03	ca
Beryllium and compounds	7440-41-7	4.0E+00	mcl	3.9E+01	nc	2.3E+03	nc	6.3E+01	mcl
Biphenthrin (Talstar)	82657-04-3	1.0E+00	s	2.4E+02	nc	1.1E+04	nc	6.8E+03	nc
1,1-Biphenyl	92-52-4	2.1E-01	nc	1.2E+01	nc	2.0E+02	nc	4.4E-02	nc
Bis(2-chloroethyl)ether	111-44-4	1.4E-02	ca	2.3E-01	ca	1.0E+01	ca	7.2E-05	ca
Bis(chloromethyl)ether	542-88-1	7.2E-05	ca	8.3E-05	ca	3.6E-03	ca	3.4E-07	ca
Bis(2-chloro-1-methylethyl)ether	108-60-1	1.8E+02	nc	7.8E+02	nc	4.7E+04	nc	1.3E+00	nc
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	6.0E+00	mcl	3.9E+01	ca	1.5E+03	ca	2.9E+01	mcl
Bisphenol A	80-05-7	1.9E+02	nc	7.9E+02	nc	3.8E+04	nc	2.9E+02	nc
Boron	7440-42-8	1.0E+03	nc	3.9E+03	nc	1.0E+05	max	6.4E+01	nc
Boron trifluoride	7637-07-2	6.6E+00	nc	7.8E+02	nc	4.7E+04	nc	--	
Bromate	15541-45-4	1.0E+01	mcl	9.9E-01	ca	4.7E+01	ca	1.5E+00	mcl
Bromobenzene	108-86-1	1.6E+01	nc	7.1E+01	nc	1.8E+03	nc	2.1E-01	nc
Bromodichloromethane	75-27-4	1.0E+02	mcl	2.9E-01	ca	1.3E+01	ca	5.4E-01	mcl
Bromoform (Tribromomethane)	75-25-2	1.0E+02	mcl	1.9E+01	ca	8.6E+02	ca	5.3E-01	mcl
Bromomethane	74-83-9	1.9E+00	nc	1.7E+00	nc	3.0E+01	nc	9.6E-03	nc
Bromophos	2104-96-3	8.9E+00	nc	9.8E+01	nc	5.8E+03	nc	7.5E-01	nc
Bromoxynil	1689-84-5	6.3E-01	ca	5.4E+00	ca	2.1E+02	ca	1.1E-02	ca
Bromoxynil octanoate	1689-99-2	2.5E-01	ca	7.0E+00	ca	3.3E+02	ca	4.4E-02	ca
1,3-Butadiene	106-99-0	1.8E-02	ca	5.8E-02	ca	2.6E+00	ca	2.0E-04	ca
1-Butanol	71-36-3	4.9E+02	nc	2.0E+03	nc	1.0E+05	max	2.0E+00	nc
Butylate	2008-41-5	1.1E+02	nc	9.8E+02	nc	5.8E+04	nc	2.2E+00	nc
Butyl benzyl phthalate	85-68-7	1.6E+01	ca	2.9E+02	ca	1.1E+04	ca	4.7E+00	ca
Butylphthalyl butylglycolate	85-70-1	3.4E+03	nc	1.6E+04	nc	1.0E+05	max	1.5E+03	nc
Cacodylic acid	75-60-5	1.0E+02	nc	3.2E+02	nc	1.5E+04	nc	5.7E-01	nc
Cadmium and compounds +++	7440-43-9	5.0E+00	mcl	1.8E+01	nc	9.5E+02	nc	7.5E+00	mcl
Camphechlor (Toxaphene)	8001-35-2	3.0E+00	mcl	4.9E-01	ca	1.9E+01	ca	9.3E+00	mcl

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE A-1: GROUNDWATER AND SOIL REMEDIATION GOALS

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Caprolactam	105-60-2	2.5E+03	nc	7.8E+03	nc	1.0E+05	max	1.2E+01	nc
Captafol	2425-06-1	4.0E-01	ca	3.6E+00	ca	1.4E+02	ca	1.4E-02	ca
Captan	133-06-2	3.1E+01	ca	2.4E+02	ca	9.2E+03	ca	4.4E-01	ca
Carbaryl	63-25-2	4.6E+02	nc	1.6E+03	nc	7.6E+04	nc	8.4E+00	nc
Carbofuran	1563-66-2	4.0E+01	mcl	7.9E+01	nc	3.8E+03	nc	3.1E-01	mcl
Carbon disulfide	75-15-0	2.0E+02	nc	1.9E+02	nc	3.5E+03	nc	1.2E+00	nc
Carbon tetrachloride	56-23-5	5.0E+00	mcl	6.5E-01	ca	2.9E+01	ca	3.9E-02	mcl
Carbosulfan	55285-14-8	2.2E+00	nc	1.6E+02	nc	7.6E+03	nc	1.1E+00	nc
Carboxin	5234-68-4	4.8E+02	nc	1.6E+03	nc	7.6E+04	nc	5.2E+00	nc
Chloramben	133-90-4	7.2E+01	nc	2.4E+02	nc	1.1E+04	nc	3.5E-01	nc
Chloranil	118-75-2	1.8E-01	ca	1.4E+00	ca	5.3E+01	ca	3.0E-03	ca
Chlordane	12789-03-6	2.0E+00	mcl	1.7E+00	ca	7.4E+01	ca	5.4E+00	mcl
Chlordecone (Kepone)	143-50-0	3.5E-03	ca	5.4E-02	ca	2.1E+00	ca	2.5E-03	ca
Chlorimuron-ethyl	90982-32-4	4.4E+02	nc	1.4E+03	nc	6.8E+04	nc	3.0E+00	nc
Chlorine	7782-50-5	7.8E-02	nc	4.8E-02	nc	8.0E-01	nc	7.7E-04	nc
Chlorine dioxide	10049-04-4	1.0E-01	nc	5.8E+02	nc	3.4E+04	nc	--	
Chloroacetic acid	79-11-8	6.0E+01	mcl	--		--		2.4E-01	mcl
2-Chloroacetophenone	532-27-4	--		1.6E+04	nc	1.0E+05	max	--	
4-Chloroaniline	106-47-8	3.7E-01	ca	2.7E+00	ca	1.1E+02	ca	3.1E-03	ca
Chlorobenzene	108-90-7	1.0E+02	mcl	6.9E+01	nc	1.3E+03	nc	1.4E+00	mcl
Chlorobenzilate	510-15-6	3.1E-01	ca	4.9E+00	ca	1.9E+02	ca	2.1E-02	ca
p-Chlorobenzoic acid	74-11-3	1.3E+02	nc	4.7E+02	nc	2.3E+04	nc	6.5E-01	nc
4-Chlorobenzotrifluoride	98-56-6	8.6E+00	nc	5.3E+01	nc	2.5E+03	nc	6.1E-01	nc
2-Chloro-1,3-butadiene	126-99-8	1.9E-02	ca	1.0E-02	ca	4.4E-01	ca	2.0E-04	ca
1-Chlorobutane	109-69-3	1.6E+02	nc	7.8E+02	nc	4.7E+04	nc	1.3E+00	nc
1-Chloro-1,1-difluoroethane	75-68-3	2.6E+04	nc	1.3E+04	nc	1.0E+05	max	2.6E+02	nc
Chlorodifluoromethane	75-45-6	2.6E+04	nc	1.2E+04	nc	1.0E+05	max	2.1E+02	nc
2-Chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester sulfurous acid (Aramite)	140-57-8	1.3E+00	ca	2.2E+01	ca	8.5E+02	ca	3.0E-01	ca
Chloroform	67-66-3	1.0E+02	mcl	3.2E-01	ca	1.4E+01	ca	5.5E-01	mcl
Chloromethane	74-87-3	4.7E+01	nc	2.8E+01	nc	4.6E+02	nc	2.4E-01	nc
4-Chloro-2-methylaniline hydrochloride	3165-93-3	1.7E-01	ca	1.2E+00	ca	4.6E+01	ca	3.1E-03	ca
beta-Chloronaphthalene	91-58-7	1.9E+02	nc	1.2E+03	nc	5.5E+04	nc	1.9E+01	nc
o-Chloronitrobenzene	88-73-3	2.4E-01	ca	1.8E+00	ca	7.1E+01	ca	4.4E-03	ca
p-Chloronitrobenzene	100-00-5	1.2E+00	ca	9.0E+00	ca	3.5E+02	ca	2.1E-02	ca
2-Chlorophenol	95-57-8	2.3E+01	nc	9.8E+01	nc	5.8E+03	nc	4.5E-01	nc
Chlorothalonil	1897-45-6	2.2E+01	ca	1.8E+02	ca	6.9E+03	ca	9.9E-01	ca
o-Chlorotoluene	95-49-8	5.9E+01	nc	3.9E+02	nc	2.3E+04	nc	1.2E+00	nc

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE A-1: GROUNDWATER AND SOIL REMEDIATION GOALS

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Chlorpropham	101-21-3	1.8E+02	nc	7.9E+02	nc	3.8E+04	nc	3.2E+00	nc
Chlorpyrifos	2921-88-2	2.1E+00	nc	1.6E+01	nc	7.6E+02	nc	6.2E-01	nc
Chlorpyrifos-methyl	5598-13-0	3.0E+01	nc	1.6E+02	nc	7.6E+03	nc	2.7E+00	nc
Chlorsulfuron	64902-72-3	2.5E+02	nc	7.9E+02	nc	3.8E+04	nc	4.2E+00	nc
Chlorthiophos	60238-56-4	7.1E-01	nc	1.3E+01	nc	6.1E+02	nc	3.6E-01	nc
Chromium, Total	7440-47-3	1.0E+02	mcl	--		--		1.0E+05	max
Chromium III *	16065-83-1	5.6E+03	nc	2.9E+04	nc	1.0E+05	max	1.0E+05	max
Chromium VI +++	18540-29-9	3.5E-02	ca	3.0E-01	ca	6.4E+01	ca	1.3E-02	ca
Clofentezine (Apollo)	74115-24-5	5.8E+01	nc	2.1E+02	nc	9.9E+03	nc	7.0E+01	nc
Cobalt	7440-48-4	1.5E+00	nc	5.9E+00	nc	3.5E+02	nc	1.4E+00	nc
Coke Oven Emissions	8007-45-2	3.3E-03	ca	3.3E+03	ca	1.0E+05	max	2.1E-03	ca
Copper and compounds	7440-50-8	1.3E+03	mcl	7.8E+02	nc	4.7E+04	nc	9.2E+02	mcl
Crotonaldehyde	123-73-9	--		--		1.7E+01	ca	--	
Cumene (Isopropylbenzene)	98-82-8	1.1E+02	nc	4.9E+02	nc	9.9E+03	nc	3.7E+00	nc
Cyanazine	21725-46-2	8.8E-02	ca	6.5E-01	ca	2.5E+01	ca	8.2E-04	ca
Cyanide (free)	57-12-5	2.0E+02	mcl	5.7E+00	nc	1.5E+02	nc	4.0E+01	mcl
Cyanide (hydrogen)	74-90-8	3.7E-01	nc	5.6E+00	nc	1.5E+02	nc	7.4E-02	nc
Cyanogen	460-19-5	5.0E+00	nc	2.0E+01	nc	1.2E+03	nc	--	
Cyanogen bromide	506-68-3	4.5E+02	nc	1.8E+03	nc	1.0E+05	max	--	
Cyanogen chloride	506-77-4	2.5E+02	nc	9.8E+02	nc	5.8E+04	nc	--	
Cyclohexane	110-82-7	3.1E+03	nc	1.6E+03	nc	2.7E+04	nc	6.5E+01	nc
Cyclohexanone	108-94-1	3.6E+02	nc	7.1E+03	nc	1.0E+05	max	1.7E+00	nc
Cyclohexylamine	108-91-8	9.6E+02	nc	3.9E+03	nc	1.0E+05	max	5.1E+00	nc
Cyfluthrin (Baythroid)	68359-37-5	3.0E+00	s	4.0E+02	nc	1.9E+04	nc	1.6E+02	nc
Cyhalothrin (Karate)	68085-85-8	5.0E+00	s	1.6E+01	nc	7.6E+02	nc	6.8E+01	nc
Cyromazine	66215-27-8	2.5E+03	nc	7.9E+03	nc	1.0E+05	max	1.3E+01	nc
Dacthal	1861-32-1	3.1E+01	nc	1.6E+02	nc	7.6E+03	nc	7.6E-01	nc
Dalapon	75-99-0	2.0E+02	mcl	4.7E+02	nc	2.3E+04	nc	8.3E-01	mcl
Daminozide (Alar)	1596-84-5	4.3E+00	ca	3.0E+01	ca	1.2E+03	ca	1.9E-02	ca
Demeton	8065-48-3	1.1E-01	nc	6.3E-01	nc	3.0E+01	nc	--	
Diallate	2303-16-4	5.4E-01	ca	8.9E+00	ca	3.5E+02	ca	1.6E-02	ca
Diazinon	333-41-5	2.6E+00	nc	1.1E+01	nc	5.3E+02	nc	3.2E-01	nc
Dibenzofuran	132-64-9	2.0E+00	nc	1.8E+01	nc	1.0E+03	nc	7.3E-01	nc
1,4-Dibromobenzene	106-37-6	3.3E+01	nc	2.0E+02	nc	1.2E+04	nc	6.2E-01	nc
Dibromochloromethane	124-48-1	1.0E+02	mcl	8.3E+00	ca	3.9E+02	ca	5.3E-01	mcl
1,2-Dibromo-3-chloropropane	96-12-8	2.0E-01	mcl	5.3E-03	ca	6.4E-01	ca	1.7E-03	mcl
1,2-Dibromoethane	106-93-4	5.0E-02	mcl	3.6E-02	ca	1.6E+00	ca	2.8E-04	mcl

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Dibutyl phthalate	84-74-2	2.3E+02	nc	1.6E+03	nc	7.6E+04	nc	1.1E+01	nc
Dicamba	1918-00-9	1.4E+02	nc	4.7E+02	nc	2.3E+04	nc	7.3E-01	nc
1,2-Dichlorobenzene	95-50-1	6.0E+02	mcl	4.5E+02	nc	9.3E+03	nc	1.2E+01	mcl
1,4-Dichlorobenzene	106-46-7	7.5E+01	mcl	2.6E+00	ca	1.1E+02	ca	1.4E+00	mcl
3,3-Dichlorobenzidine	91-94-1	1.3E-01	ca	1.2E+00	ca	4.7E+01	ca	1.6E-02	ca
4,4'-Dichlorobenzophenone	90-98-2	1.9E+01	nc	1.4E+02	nc	6.8E+03	nc	2.4E+00	nc
1,4-Dichloro-2-butene	764-41-0	1.3E-03	ca	2.1E-03	ca	9.4E-02	ca	1.3E-05	ca
Dichlorodifluoromethane	75-71-8	4.9E+01	nc	2.2E+01	nc	3.7E+02	nc	1.5E+00	nc
p,p'-Dichlorodiphenyldichloroethane (DDD)	72-54-8	1.6E-02	nc	4.7E-01	nc	2.3E+01	nc	7.5E-02	nc
p,p'-Dichlorodiphenyldichloroethylene (DDE)	72-55-9	4.6E-02	ca	2.0E+00	ca	9.3E+01	ca	2.2E-01	ca
p,p'-Dichlorodiphenyltrichloroethane (DDT)	50-29-3	2.3E-01	ca	1.9E+00	ca	8.3E+01	ca	1.5E+00	ca
1,1-Dichloroethane	75-34-3	2.8E+00	ca	3.6E+00	ca	1.6E+02	ca	1.6E-02	ca
1,2-Dichloroethane	107-06-2	5.0E+00	mcl	4.6E-01	ca	2.0E+01	ca	2.8E-02	mcl
1,1-Dichloroethylene	75-35-4	7.0E+00	mcl	5.7E+01	nc	1.0E+03	nc	5.0E-02	mcl
1,2-Dichloroethylene (cis)	156-59-2	7.0E+01	mcl	3.9E+01	nc	2.3E+03	nc	4.1E-01	mcl
1,2-Dichloroethylene (trans)	156-60-5	1.0E+02	mcl	3.9E+02	nc	2.3E+04	nc	6.3E-01	mcl
2,4-Dichlorophenol	120-83-2	1.1E+01	nc	4.7E+01	nc	2.3E+03	nc	1.1E-01	nc
2,4-Dichlorophenoxy acetic acid (2,4-D)	94-75-7	7.0E+01	mcl	1.7E+02	nc	9.2E+03	nc	3.6E-01	mcl
2,4-Dichlorophenoxy butyric acid (2,4-DB)	94-82-6	1.1E+02	nc	4.7E+02	nc	2.3E+04	nc	2.1E+00	nc
Decabromodiphenyl ether (BDE-209)	1163-19-5	1.0E-01	s	1.1E+02	nc	5.3E+03	nc	3.9E+02	nc
1,2-Dichloropropane	78-87-5	5.0E+00	mcl	2.5E+00	ca	6.6E+01	nc	3.3E-02	mcl
2,3-Dichloropropanol	616-23-9	1.5E+01	nc	4.7E+01	nc	2.3E+03	nc	6.3E-02	nc
1,3-Dichloropropene	542-75-6	4.7E-01	ca	1.8E+00	ca	8.2E+01	ca	3.4E-03	ca
Dichlorvos	62-73-7	2.6E-01	ca	1.9E+00	ca	7.3E+01	ca	1.6E-03	ca
Dicrotophos (Bidrin)	141-66-2	1.5E-01	nc	4.7E-01	nc	2.3E+01	nc	7.0E-04	nc
Dicyclopentadiene	77-73-6	1.6E-01	nc	3.2E-01	nc	5.4E+00	nc	1.1E-02	nc
Dieldrin	60-57-1	1.8E-03	ca	3.4E-02	ca	1.3E+00	ca	1.4E-03	ca
Diethylene glycol, monobutyl ether	112-34-5	1.5E+02	nc	4.7E+02	nc	2.2E+04	nc	6.6E-01	nc
Diethylene glycol, monoethyl ether	111-90-0	3.0E+02	nc	9.4E+02	nc	4.5E+04	nc	1.2E+00	nc
Diethylformamide	617-84-5	5.0E+00	nc	2.0E+01	nc	1.2E+03	nc	2.0E-02	nc
Di(2-ethylhexyl)adipate	103-23-1	4.0E+02	mcl	4.5E+02	ca	1.8E+04	ca	5.8E+02	mcl
Diethyl phthalate	84-66-2	3.7E+03	nc	1.3E+04	nc	1.0E+05	max	3.0E+01	nc
Diethylstilbestrol	56-53-1	5.1E-05	ca	1.6E-03	ca	6.1E-02	ca	5.6E-04	ca
Difenzoquat (Avenge)	43222-48-6	4.2E+02	nc	1.3E+03	nc	6.3E+04	nc	1.3E+03	nc
Diflubenzuron	35367-38-5	7.2E+01	nc	3.2E+02	nc	1.5E+04	nc	1.6E+00	nc
1,1-Difluoroethane	75-37-6	2.1E+04	nc	1.2E+04	nc	1.0E+05	max	1.4E+02	nc
Diisopropyl methylphosphonate (DIMP)	1445-75-6	4.0E+02	nc	1.6E+03	nc	9.3E+04	nc	2.3E+00	nc

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Dimethipin	55290-64-7	1.1E+02	nc	3.5E+02	nc	1.7E+04	nc	4.8E-01	nc
Dimethoate	60-51-5	1.1E+01	nc	3.5E+01	nc	1.7E+03	nc	4.9E-02	nc
3,3'-Dimethoxybenzidine	119-90-4	4.7E-02	ca	3.4E-01	ca	1.3E+01	ca	1.2E-03	ca
N-N-Dimethylaniline	121-69-7	2.5E+00	ca	2.6E+01	ca	1.2E+03	ca	1.8E-02	ca
2,4-Dimethylaniline	95-68-1	3.7E-01	ca	2.7E+00	ca	1.1E+02	ca	4.2E-03	ca
2,4-Dimethylaniline hydrochloride	21436-96-4	1.3E-01	ca	9.4E-01	ca	3.7E+01	ca	2.4E-03	ca
3,3'-Dimethylbenzidine	119-93-7	6.5E-03	ca	4.9E-02	ca	1.9E+00	ca	8.6E-04	ca
N,N-Dimethylformamide	68-12-2	1.5E+01	nc	6.6E+02	nc	1.5E+04	nc	6.1E-02	nc
2,4-Dimethylphenol	105-67-9	8.9E+01	nc	3.2E+02	nc	1.5E+04	nc	2.1E+00	nc
2,6-Dimethylphenol	576-26-1	2.6E+00	nc	9.5E+00	nc	4.6E+02	nc	6.3E-02	nc
3,4-Dimethylphenol	95-65-8	4.5E+00	nc	1.6E+01	nc	7.6E+02	nc	1.1E-01	nc
Dimethyl terephthalate	120-61-6	4.7E+02	nc	2.0E+03	nc	1.0E+05	max	2.4E+00	nc
4,6-Dinitro-o-cyclohexyl phenol	131-89-5	5.8E+00	nc	3.2E+01	nc	1.5E+03	nc	3.8E+00	nc
1,2-Dinitrobenzene	528-29-0	4.8E-01	nc	1.6E+00	nc	7.6E+01	nc	8.9E-03	nc
1,3-Dinitrobenzene	99-65-0	4.9E-01	nc	1.6E+00	nc	7.6E+01	nc	8.8E-03	nc
1,4-Dinitrobenzene	100-25-4	4.9E-01	nc	1.6E+00	nc	7.6E+01	nc	8.8E-03	nc
2,4-Dinitrophenol	51-28-5	9.7E+00	nc	3.2E+01	nc	1.5E+03	nc	2.2E-01	nc
Dinitrotoluene mixture	25321-14-6	1.0E-01	ca	1.2E+00	ca	4.7E+01	ca	2.9E-03	ca
2,4-Dinitrotoluene	121-14-2	2.4E-01	ca	1.7E+00	ca	6.8E+01	ca	6.4E-03	ca
2,6-Dinitrotoluene	606-20-2	4.9E-02	ca	3.6E-01	ca	1.4E+01	ca	1.3E-03	ca
Dinoseb	88-85-7	7.0E+00	mcl	1.6E+01	nc	7.6E+02	nc	1.2E+00	mcl
1,4-Dioxane	123-91-1	4.6E-01	ca	5.3E+00	ca	2.4E+02	ca	1.9E-03	ca
Diphenamid	957-51-7	1.3E+02	nc	4.7E+02	nc	2.3E+04	nc	2.6E+01	nc
Diphenylamine	122-39-4	3.1E+02	nc	1.6E+03	nc	7.6E+04	nc	1.2E+01	nc
N,N-Diphenyl-1,4 benzenediamine (DPPD)	74-31-7	9.0E-01	nc	4.7E+00	nc	2.3E+02	nc	1.9E+00	nc
1,2-Diphenylhydrazine	122-66-7	7.8E-02	ca	6.8E-01	ca	2.7E+01	ca	5.0E-03	ca
Diphenyl sulfone	127-63-9	3.7E+00	nc	1.3E+01	nc	6.1E+02	nc	1.8E-01	nc
Diquat dibromide (Diquat)	85-00-7	2.0E+01	mcl	3.5E+01	nc	1.7E+03	nc	7.5E+00	mcl
Direct black 38	1937-37-7	1.1E-02	ca	7.6E-02	ca	3.0E+00	ca	1.1E+02	ca
Direct blue 6	2602-46-2	1.1E-02	ca	7.3E-02	ca	2.9E+00	ca	3.3E+02	ca
Direct brown 95	16071-86-6	1.2E-02	ca	8.1E-02	ca	3.2E+00	ca	3.2E+00	ca
Disulfoton	298-04-4	1.3E-01	nc	6.3E-01	nc	3.0E+01	nc	4.7E-03	nc
1,4-Dithiane	505-29-3	5.0E+01	nc	2.0E+02	nc	1.2E+04	nc	4.9E-01	nc
Diuron	330-54-1	9.0E+00	nc	3.2E+01	nc	1.5E+03	nc	7.5E-02	nc
Dodine	2439-10-3	1.0E+02	nc	3.2E+02	nc	1.5E+04	nc	1.0E+01	nc
Endosulfan	115-29-7	2.5E+01	nc	1.2E+02	nc	7.0E+03	nc	6.9E+00	nc
Endothall	145-73-3	1.0E+02	mcl	3.2E+02	nc	1.5E+04	nc	4.8E-01	mcl

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Endrin	72-20-8	2.0E+00	mcl	4.7E+00	nc	2.3E+02	nc	1.6E+00	mcl
Enilconazole (Imazalil)	35554-44-0	9.0E-01	ca	8.9E+00	ca	3.5E+02	ca	3.1E-01	ca
Epichlorohydrin	106-89-8	5.1E-01	nc	4.7E+00	nc	8.2E+01	nc	2.3E-03	nc
1,2-Epoxybutane	106-88-7	1.0E+01	nc	4.0E+01	nc	6.7E+02	nc	4.6E-02	nc
S-Ethyl dipropylthiocarbamate (EPTC)	759-94-4	1.9E+02	nc	9.8E+02	nc	5.8E+04	nc	2.0E+00	nc
2-Chloroethyl phosphonic acid (Ethephon)	16672-87-0	2.5E+01	nc	7.9E+01	nc	3.8E+03	nc	1.1E-01	nc
Ethion	563-12-2	1.1E+00	nc	7.9E+00	nc	3.8E+02	nc	4.3E-02	nc
2-Ethoxyethanol	110-80-5	8.5E+01	nc	1.3E+03	nc	4.7E+04	nc	3.4E-01	nc
2-Ethoxyethanol acetate	111-15-9	2.9E+01	nc	6.4E+02	nc	1.4E+04	nc	1.2E-01	nc
Ethyl acetate	141-78-6	3.6E+01	nc	1.6E+02	nc	2.6E+03	nc	1.5E-01	nc
Ethyl acrylate	140-88-5	3.6E+00	nc	1.2E+01	nc	2.1E+02	nc	1.6E-02	nc
Ethylbenzene	100-41-4	7.0E+02	mcl	5.8E+00	ca	2.5E+02	ca	1.6E+01	mcl
Ethyl chloride (Chloroethane)	75-00-3	5.2E+03	nc	3.4E+03	nc	5.7E+04	nc	3.0E+01	nc
Ethylene cyanohydrin	109-78-4	3.5E+02	nc	1.1E+03	nc	5.3E+04	nc	1.4E+00	nc
Ethylene diamine	107-15-3	4.5E+02	nc	1.8E+03	nc	1.0E+05	max	2.1E+00	nc
Ethylene glycol	107-21-1	1.0E+04	nc	3.2E+04	nc	1.0E+05	max	4.0E+01	nc
Ethylene glycol, monobutyl ether	111-76-2	4.9E+02	nc	1.6E+03	nc	7.6E+04	nc	2.0E+00	nc
Ethylene oxide	75-21-8	6.7E-04	ca	2.0E-03	ca	2.5E-01	ca	2.8E-06	ca
Ethylene thiourea (ETU)	96-45-7	4.0E-01	nc	1.3E+00	nc	6.1E+01	nc	1.8E-03	nc
Ethyl ether	60-29-7	9.8E+02	nc	3.9E+03	nc	1.0E+05	max	4.4E+00	nc
Ethyl methacrylate	97-63-2	1.6E+02	nc	4.5E+02	nc	7.6E+03	nc	7.4E-01	nc
Ethyl p-nitrophenyl phenylphosphorothioate (EPN)	2104-64-5	2.2E-02	nc	1.6E-01	nc	7.6E+00	nc	1.4E-02	nc
Ethylphthalyl ethyl glycolate	84-72-0	1.4E+04	nc	4.7E+04	nc	1.0E+05	max	6.5E+02	nc
Fenamiphos	22224-92-6	1.1E+00	nc	4.0E+00	nc	1.9E+02	nc	2.2E-02	nc
Fenpropathrin (Danitol)	39515-41-8	1.6E+01	nc	4.0E+02	nc	1.9E+04	nc	1.4E+01	nc
Fenvalerate (Pydrin)	51630-58-1	2.4E+01	s	4.0E+02	nc	1.9E+04	nc	1.6E+03	nc
Fluometuron	2164-17-2	6.1E+01	nc	2.1E+02	nc	9.9E+03	nc	9.3E-01	nc
Fluoride	16984-48-8	4.0E+03	mcl	7.8E+02	nc	4.7E+04	nc	1.2E+04	mcl
Fluoridone	59756-60-4	3.6E+02	nc	1.3E+03	nc	6.1E+04	nc	8.2E+02	nc
Flurprimidol	56425-91-3	1.7E+02	nc	6.3E+02	nc	3.0E+04	nc	1.6E+01	nc
Flusilazole (NuStar)	85509-19-9	7.8E+00	nc	3.9E+01	nc	2.3E+03	nc	2.5E+01	nc
Flutolanil	66332-96-5	2.0E+03	nc	7.9E+03	nc	1.0E+05	max	2.1E+02	nc
Fluvalinate	69409-94-5	5.0E+00	s	1.6E+02	nc	7.6E+03	nc	1.5E+03	nc
Folpet	133-07-3	4.1E+02	nc	1.4E+03	nc	6.8E+04	nc	1.9E+00	nc
Fomesafen	72178-02-0	1.2E+01	nc	4.0E+01	nc	1.9E+03	nc	7.9E-01	nc
Fonofos	944-22-9	6.1E+00	nc	3.2E+01	nc	1.5E+03	nc	2.3E-01	nc
Formaldehyde	50-00-0	4.3E-01	ca	1.7E+01	ca	7.3E+02	ca	1.7E-03	ca

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Formic acid	64-18-6	1.6E-01	nc	7.3E+00	nc	1.2E+02	nc	6.3E-04	nc
Fosetyl-al	39148-24-8	1.3E+04	nc	4.0E+04	nc	1.0E+05	max	3.3E+03	nc
Furan	110-00-9	4.8E+00	nc	1.8E+01	nc	1.0E+03	nc	3.7E-02	nc
Furazolidone	67-45-8	2.0E-02	ca	1.4E-01	ca	5.6E+00	ca	7.8E-04	ca
Furfural	98-01-1	9.5E+00	nc	5.4E+01	nc	2.6E+03	nc	4.0E-02	nc
Furmecyclox	60568-05-0	1.1E+00	ca	1.8E+01	ca	7.1E+02	ca	2.4E-02	ca
Furothiazole (Furium)	531-82-8	5.1E-02	ca	3.6E-01	ca	1.4E+01	ca	1.4E-03	ca
Glufosinate-ammonium	77182-82-2	3.0E+01	nc	9.5E+01	nc	4.6E+03	nc	1.3E-01	nc
Glycidaldehyde	765-34-4	4.1E-01	nc	5.8E+00	nc	2.1E+02	nc	1.7E-03	nc
Glyphosate	1071-83-6	7.0E+02	mcl	1.6E+03	nc	7.6E+04	nc	6.2E+01	mcl
Haloxyfop-methyl	69806-40-2	1.9E-01	nc	7.9E-01	nc	3.8E+01	nc	4.2E-02	nc
Thifensulfuron-methyl (Harmony)	79277-27-3	2.1E+02	nc	6.8E+02	nc	3.3E+04	nc	1.3E+00	nc
Heptachlor	76-44-8	4.0E-01	mcl	1.3E-01	ca	6.3E+00	ca	6.6E-01	mcl
Heptachlor epoxide	1024-57-3	2.0E-01	mcl	7.0E-02	ca	3.3E+00	ca	8.2E-02	mcl
Hexabromobenzene	87-82-1	1.6E-01	s	3.9E+01	nc	2.3E+03	nc	1.2E+00	nc
Hexachlorobenzene	118-74-1	1.0E+00	mcl	2.1E-01	ca	9.6E+00	ca	2.5E-01	mcl
Hexachlorobutadiene	87-68-3	1.4E-01	ca	1.2E+00	ca	5.3E+01	ca	5.3E-03	ca
alpha-Hexachlorocyclohexane (alpha-HCH)	319-84-6	7.2E-03	ca	8.6E-02	ca	3.4E+00	ca	8.4E-04	ca
beta-Hexachlorocyclohexane (beta-HCH)	319-85-7	2.5E-02	ca	3.0E-01	ca	1.2E+01	ca	2.9E-03	ca
gamma-Hexachlorocyclohexane (Lindane)	58-89-9	2.0E-01	mcl	5.7E-01	ca	2.4E+01	ca	2.3E-02	mcl
Hexachlorocyclohexane technical	608-73-1	2.5E-02	ca	3.0E-01	ca	1.2E+01	ca	2.9E-03	ca
Hexachlorocyclopentadiene	77-47-4	5.0E+01	mcl	4.4E-01	nc	7.5E+00	nc	3.1E+00	mcl
Hexachloroethane	67-72-1	3.3E-01	ca	1.8E+00	ca	8.0E+01	ca	4.0E-03	ca
Hexachlorophene	70-30-4	1.5E+00	nc	4.7E+00	nc	2.3E+02	nc	4.0E+01	nc
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX/Cyclonite)	121-82-4	7.0E-01	ca	6.1E+00	ca	2.8E+02	ca	5.3E-03	ca
1,6-Hexamethylene diisocyanate	822-06-0	5.2E-03	nc	7.8E-01	nc	1.3E+01	nc	1.0E-03	nc
n-Hexane	110-54-3	3.7E+02	nc	1.5E+02	nc	2.5E+03	nc	5.1E+01	nc
Hexazinone	51235-04-2	1.6E+02	nc	5.2E+02	nc	2.5E+04	nc	1.5E+00	nc
Hexythiazox (Savey)	78587-05-0	2.8E+01	nc	4.0E+02	nc	1.9E+04	nc	2.5E+00	nc
Hydramethylnon (Amdro)	67485-29-4	6.0E+00	s	2.7E+02	nc	1.3E+04	nc	1.0E+05	max
Hydrazine, hydrazine sulfate	302-01-2	1.1E-03	ca	2.3E-01	ca	1.1E+01	ca	--	
Hydrazine, dimethyl	57-14-7	1.0E-03	nc	1.4E-02	nc	2.4E-01	nc	4.7E-06	nc
Hydrogen chloride	7647-01-0	1.0E+01	nc	1.0E+05	max	1.0E+05	max	--	
Hydrogen sulfide	7783-06-4	1.0E+00	nc	1.0E+05	max	1.0E+05	max	--	
p-Hydroquinone	123-31-9	1.3E+00	ca	9.0E+00	ca	3.5E+02	ca	1.7E-02	ca
Imazaquin	81335-37-7	1.2E+03	nc	4.0E+03	nc	1.0E+05	max	1.2E+02	nc
Imazethapyr (Pursuit)	81335-77-5	1.2E+04	nc	4.0E+04	nc	1.0E+05	max	2.1E+02	nc

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Iprodione	36734-19-7	1.8E+02	nc	6.3E+02	nc	3.0E+04	nc	1.1E+00	nc
Iron	7439-89-6	3.0E+02	mcl	1.4E+04	nc	1.0E+05	max	1.5E+02	mcl
Isobutanol (Isobutyl alcohol)	78-83-1	1.5E+03	nc	5.9E+03	nc	1.0E+05	max	6.1E+00	nc
Isophorone	78-59-1	7.8E+01	ca	5.7E+02	ca	2.2E+04	ca	5.2E-01	ca
Isopropalin	33820-53-0	1.0E+01	nc	2.9E+02	nc	1.8E+04	nc	4.6E+00	nc
Isopropyl methyl phosphonic acid	1832-54-8	5.0E+02	nc	1.6E+03	nc	7.6E+04	nc	2.1E+00	nc
Isoxaben	82558-50-7	1.8E+02	nc	7.9E+02	nc	3.8E+04	nc	1.0E+01	nc
Lactofen	77501-63-4	2.5E+01	nc	1.3E+02	nc	6.1E+03	nc	2.3E+01	nc
Lead +++	7439-92-1	1.5E+01	mcl	4.0E+02	nc	8.0E+02	nc	2.7E+02	mcl
Lead (tetraethyl)	78-00-2	3.3E-04	nc	2.0E-03	nc	1.2E-01	nc	2.3E-05	nc
Linuron	330-55-2	3.2E+01	nc	1.2E+02	nc	5.8E+03	nc	5.6E-01	nc
Lithium	7439-93-2	1.0E+01	nc	4.0E+02	nc	2.3E+03	nc	6.0E+01	nc
Malathion	121-75-5	9.7E+01	nc	3.2E+02	nc	1.5E+04	nc	5.1E-01	nc
Maleic anhydride	108-31-6	4.8E+02	nc	1.6E+03	nc	7.5E+04	nc	1.9E+00	nc
Maleic hydrazide	123-33-1	2.5E+03	nc	7.9E+03	nc	1.0E+05	max	1.0E+01	nc
Malononitrile	109-77-3	5.0E-01	nc	1.6E+00	nc	7.6E+01	nc	2.1E-03	nc
Mancozeb	8018-01-7	1.3E+02	nc	4.7E+02	nc	2.3E+04	nc	3.8E+00	nc
Maneb	12427-38-2	2.4E+01	nc	7.9E+01	nc	3.8E+03	nc	6.9E-01	nc
Manganese (non-food) +++	7439-96-5	5.0E+01	mcl	2.5E+03	nc	1.0E+05	max	6.5E+01	mcl
Mephosfolan	950-10-7	4.5E-01	nc	1.4E+00	nc	6.8E+01	nc	1.3E-02	nc
Mepiquat chloride (Mepiquat)	24307-26-4	1.5E+02	nc	4.7E+02	nc	2.3E+04	nc	1.0E+00	nc
Mercury and compounds	7487-94-7	2.0E+00	mcl	5.9E+00	nc	3.5E+02	nc	--	
Mercury (elemental)	7439-97-6	2.0E+00	mcl	2.7E+00	nc	4.6E+01	nc	2.1E+00	mcl
Mercury (methyl)	22967-92-6	4.9E-01	nc	2.0E+00	nc	1.2E+02	nc	--	
Merphos	150-50-5	1.5E-01	nc	5.9E-01	nc	3.5E+01	nc	3.0E-01	nc
Merphos oxide	78-48-8	7.1E-02	nc	1.6E+00	nc	7.6E+01	nc	7.0E-03	nc
Metalaxyl	57837-19-1	3.0E+02	nc	9.5E+02	nc	4.6E+04	nc	1.6E+00	nc
Methacrylonitrile	126-98-7	4.8E-01	nc	1.9E+00	nc	1.0E+02	nc	2.2E-03	nc
Methamidophos	10265-92-6	2.5E-01	nc	7.9E-01	nc	3.8E+01	nc	1.1E-03	nc
Methanol	67-56-1	5.1E+03	nc	3.1E+04	nc	1.0E+05	max	2.1E+01	nc
Methidathion	950-37-8	7.3E+00	nc	2.4E+01	nc	1.1E+03	nc	3.5E-02	nc
Methomyl	16752-77-5	1.2E+02	nc	4.0E+02	nc	1.9E+04	nc	5.5E-01	nc
Methoxychlor	72-43-5	4.0E+01	mcl	7.9E+01	nc	3.8E+03	nc	4.3E+01	mcl
2-Methoxyethanol	109-86-4	7.4E+00	nc	8.2E+01	nc	3.5E+03	nc	3.0E-02	nc
2-Methoxyethanol acetate	110-49-6	5.1E-01	nc	2.7E+01	nc	5.1E+02	nc	2.1E-03	nc
2-Methoxy-5-nitroaniline	99-59-2	1.5E+00	ca	1.1E+01	ca	4.3E+02	ca	1.1E-02	ca
Methyl acetate	79-20-9	5.0E+03	nc	2.0E+04	nc	1.0E+05	max	2.1E+01	nc

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Methyl acrylate	96-33-3	1.0E+01	nc	3.6E+01	nc	6.1E+02	nc	4.4E-02	nc
2-Methylaniline hydrochloride	636-21-5	6.0E-01	ca	4.2E+00	ca	1.6E+02	ca	5.2E-03	ca
Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	17804-35-2	2.4E+02	nc	7.9E+02	nc	3.8E+04	nc	4.2E+00	nc
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	94-74-6	1.9E+00	nc	7.9E+00	nc	3.8E+02	nc	9.8E-03	nc
4-(2-Methyl-4-chlorophenoxy) butyric acid (MCPB)	94-81-5	1.6E+01	nc	7.0E+01	nc	3.3E+03	nc	1.3E-01	nc
2-(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)	93-65-2	3.9E+00	nc	1.6E+01	nc	7.6E+02	nc	2.3E-02	nc
4,4'-Methylenebisbenzeneamine	101-77-9	4.7E-02	ca	3.4E-01	ca	1.3E+01	ca	4.2E-03	ca
4,4'-Methylene bis(2-chloroaniline)	101-14-4	1.6E-01	ca	1.2E+00	ca	2.1E+02	ca	3.7E-02	ca
4,4'-Methylene bis(N,N'-dimethyl)aniline	101-61-1	4.8E-01	ca	1.2E+01	ca	4.6E+02	ca	5.3E-02	ca
Methylene bromide	74-95-3	2.1E+00	nc	5.9E+00	nc	9.9E+01	nc	1.0E-02	nc
Methylene chloride	75-09-2	5.0E+00	mcl	5.7E+01	ca	3.2E+03	nc	2.6E-02	mcl
4,4'-Methylenediphenyl isocyanate	101-68-8	--		1.0E+05	max	1.0E+05	max	--	
2-(1-Methylethoxy)phenol methylcarbamate (Baygon)	114-26-1	2.0E+01	nc	6.3E+01	nc	3.0E+03	nc	1.3E-01	nc
Methyl ethyl ketone (2-Butanone)	78-93-3	1.4E+03	nc	6.8E+03	nc	1.0E+05	max	5.8E+00	nc
Methyl isobutyl ketone (4-Methyl-2-pentanone)	108-10-1	1.6E+03	nc	8.3E+03	nc	1.0E+05	max	7.1E+00	nc
Methyl methacrylate	80-62-6	3.5E+02	nc	1.1E+03	nc	1.9E+04	nc	1.5E+00	nc
2-Methyl-5-nitroaniline	99-55-8	8.2E+00	ca	6.0E+01	ca	2.4E+03	ca	9.1E-02	ca
Methyl parathion	298-00-0	1.1E+00	nc	4.0E+00	nc	1.9E+02	nc	3.7E-02	nc
2-Methylphenol	95-48-7	2.3E+02	nc	7.9E+02	nc	3.8E+04	nc	3.8E+00	nc
3-Methylphenol	108-39-4	2.3E+02	nc	7.9E+02	nc	3.8E+04	nc	3.7E+00	nc
4-Methylphenol	106-44-5	4.6E+02	nc	1.6E+03	nc	7.6E+04	nc	7.4E+00	nc
Methyl phosphonic acid	993-13-5	3.0E+02	nc	9.5E+02	nc	4.6E+04	nc	1.2E+00	nc
Methyl styrene (mixture)	25013-15-4	5.7E+00	nc	8.0E+01	nc	2.6E+03	nc	1.9E-01	nc
Methyl styrene (alpha)	98-83-9	1.9E+02	nc	1.4E+03	nc	8.2E+04	nc	6.2E+00	nc
Methyl tertbutyl ether (MTBE)	1634-04-4	1.4E+01	ca	4.7E+01	ca	2.1E+03	ca	6.4E-02	ca
Metolaclor (Dual)	51218-45-2	6.8E+02	nc	2.4E+03	nc	1.0E+05	max	1.6E+01	nc
Metribuzin	21087-64-9	1.2E+02	nc	4.0E+02	nc	1.9E+04	nc	7.5E-01	nc
Metsulfuron-methyl (Ally)	74223-64-6	1.2E+03	nc	4.0E+03	nc	1.0E+05	max	9.5E+00	nc
Mirex	2385-85-5	8.8E-04	ca	3.6E-02	ca	1.7E+00	ca	1.3E-02	ca
Molinate	2212-67-1	7.5E+00	nc	3.2E+01	nc	1.5E+03	nc	8.4E-02	nc
Molybdenum	7439-98-7	2.5E+01	nc	9.8E+01	nc	5.8E+03	nc	1.0E+01	nc
Monochloramine	10599-90-3	4.0E+03	mcl	2.0E+03	nc	1.0E+05	max	--	
Myclobutanil (Systhane)	88671-89-0	1.1E+02	nc	4.0E+02	nc	1.9E+04	nc	2.8E+01	nc
Naled	300-76-5	1.0E+01	nc	3.9E+01	nc	2.3E+03	nc	9.0E-02	nc
Napropamide	15299-99-7	4.9E+02	nc	1.9E+03	nc	9.1E+04	nc	6.5E+01	nc
Nickel and compounds	7440-02-0	9.8E+01	nc	3.9E+02	nc	2.3E+04	nc	1.3E+02	nc
Nickel refinery dust	7440-02-0-NRD	5.4E+01	nc	2.1E+02	nc	1.2E+04	nc	1.6E+02	nc

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Nickel subsulfide	12035-72-2	4.5E-02	ca	4.1E-01	ca	1.9E+01	ca	--	
Nitrate	14797-55-8	1.0E+04	mcl	3.1E+04	nc	1.0E+05	max	--	
Nitrite	14797-65-0	1.0E+03	mcl	2.0E+03	nc	1.0E+05	max	--	
2-Nitroaniline	88-74-4	4.7E+01	nc	1.6E+02	nc	7.5E+03	nc	4.0E-01	nc
Nitrobenzene	98-95-3	1.4E-01	ca	5.1E+00	ca	2.2E+02	ca	1.8E-03	ca
Nitrofurantoin	67-20-9	3.5E+02	nc	1.1E+03	nc	5.3E+04	nc	3.0E+00	nc
Nitrofurazone	59-87-0	6.0E-02	ca	4.2E-01	ca	1.6E+01	ca	1.1E-03	ca
Nitroglycerin	55-63-0	4.9E-01	nc	1.6E+00	nc	7.6E+01	nc	4.2E-03	nc
Nitroguanidine	556-88-7	5.0E+02	nc	1.6E+03	nc	7.6E+04	nc	2.4E+00	nc
2-Nitropropane	79-46-9	2.1E-03	ca	1.4E-02	ca	6.0E-01	ca	1.1E-05	ca
N-Nitrosodi-n-butylamine	924-16-3	2.7E-03	ca	9.9E-02	ca	4.6E+00	ca	1.1E-04	ca
N-Nitrosodiethanolamine	1116-54-7	2.8E-02	ca	1.9E-01	ca	7.6E+00	ca	1.1E-04	ca
N-Nitrosodiethylamine	55-18-5	1.7E-04	ca	8.1E-04	ca	1.4E-01	ca	1.2E-06	ca
N-Nitrosodimethylamine	62-75-9	1.1E-04	ca	2.0E-03	ca	3.4E-01	ca	5.5E-07	ca
N-Nitrosodiphenylamine	86-30-6	1.2E+01	ca	1.1E+02	ca	4.3E+03	ca	1.3E+00	ca
N-Nitroso di-n-propylamine	621-64-7	1.1E-02	ca	7.8E-02	ca	3.0E+00	ca	1.6E-04	ca
N-Nitroso-N-methylethylamine	10595-95-6	7.1E-04	ca	2.0E-02	ca	9.1E-01	ca	4.1E-06	ca
N-Nitrosopyrrolidine	930-55-2	3.7E-02	ca	2.6E-01	ca	1.0E+01	ca	2.8E-04	ca
m-Nitrotoluene	99-08-1	4.4E-01	nc	1.6E+00	nc	7.6E+01	nc	8.1E-03	nc
o-Nitrotoluene	88-72-2	3.1E-01	ca	3.2E+00	ca	1.5E+02	ca	5.9E-03	ca
p-Nitrotoluene	99-99-0	4.3E+00	ca	3.4E+01	ca	1.3E+03	ca	7.9E-02	ca
Norflurazon	27314-13-2	7.2E+01	nc	2.4E+02	nc	1.1E+04	nc	9.3E+00	nc
Octabromodiphenyl ether	32536-52-0	1.1E-05	s	4.7E+01	nc	2.3E+03	nc	6.0E+01	nc
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	2.5E+02	nc	9.6E+02	nc	5.7E+04	nc	6.3E+00	nc
Octamethylpyrophosphoramide	152-16-9	1.0E+01	nc	3.2E+01	nc	1.5E+03	nc	4.8E-02	nc
Oryzalin	19044-88-3	7.9E+00	ca	7.0E+01	ca	2.7E+03	ca	2.9E-01	ca
Oxadiazon	19666-30-9	1.2E+01	nc	7.9E+01	nc	3.8E+03	nc	2.4E+00	nc
Oxamyl	23135-22-0	2.0E+02	mcl	4.0E+02	nc	1.9E+04	nc	8.8E-01	mcl
Oxyfluorfen	42874-03-3	5.4E-01	ca	7.4E+00	ca	2.9E+02	ca	8.6E-01	ca
Paclobutrazol	76738-62-0	5.7E+01	nc	2.1E+02	nc	9.9E+03	nc	2.3E+00	nc
Paraquat	4685-14-7	2.3E+01	nc	7.1E+01	nc	3.4E+03	nc	7.0E+00	nc
Parathion	56-38-2	2.1E+01	nc	9.5E+01	nc	4.6E+03	nc	2.2E+00	nc
Pebulate	1114-71-2	1.4E+02	nc	9.8E+02	nc	5.8E+04	nc	2.2E+00	nc
Pendimethalin	40487-42-1	3.4E+01	nc	4.7E+02	nc	2.3E+04	nc	7.8E+00	nc
Pentabromo-6-chloro cyclohexane	87-84-3	2.8E+00	ca	2.7E+01	ca	1.1E+03	ca	3.2E-01	ca
Pentabromodiphenyl ether	32534-81-9	2.4E+00	s	3.9E+01	nc	2.3E+03	nc	8.7E+00	nc
Pentachlorobenzene	608-93-5	7.9E-01	nc	1.6E+01	nc	9.3E+02	nc	1.2E-01	nc

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Pentachloronitrobenzene	82-68-8	1.2E-01	ca	2.7E+00	ca	1.3E+02	ca	3.0E-02	ca
Pentachlorophenol	87-86-5	1.0E+00	mcl	1.0E+00	ca	3.5E+01	ca	2.8E-02	mcl
Perchlorate	14797-73-0	1.5E+01	nc	1.4E+01	nc	8.2E+02	nc	--	
Perfluoroalkyl Compounds									
Perfluoro-octanesulfonate (PFOS)^^	1763-23-1	7.0E-02	hal	3.2E+00	nc	1.5E+02	nc	7.8E-04	mcl
Perfluorooctanoic acid (PFOA)^^	335-67-1	7.0E-02	hal	3.2E-01	nc	1.5E+01	nc	6.0E-04	mcl
Permethrin	52645-53-1	6.0E+00	s	7.9E+02	nc	3.8E+04	nc	1.2E+03	nc
Phenmedipham	13684-63-4	9.5E+02	nc	3.8E+03	nc	1.0E+05	max	1.0E+02	nc
Phenol	108-95-2	1.4E+03	nc	4.7E+03	nc	1.0E+05	max	1.7E+01	nc
m-Phenylenediamine	108-45-2	3.0E+01	nc	9.5E+01	nc	4.6E+03	nc	1.6E-01	nc
p-Phenylenediamine	106-50-3	5.0E+00	nc	1.6E+01	nc	7.6E+02	nc	2.7E-02	nc
Phenylmercuric acetate	62-38-4	4.0E-01	nc	1.3E+00	nc	6.1E+01	nc	2.5E-03	nc
2-Phenylphenol	90-43-7	3.1E+01	ca	2.9E+02	ca	1.1E+04	ca	8.3E+00	ca
Phorate	298-02-2	7.6E-01	nc	3.2E+00	nc	1.5E+02	nc	1.7E-02	nc
Phosmet	732-11-6	9.3E+01	nc	3.2E+02	nc	1.5E+04	nc	4.1E-01	nc
Phosphine	7803-51-2	1.4E-01	nc	5.9E+00	nc	3.5E+02	nc	--	
Phosphoric acid	7664-38-2	2.4E+05	nc	1.0E+05	max	1.0E+05	max	--	
Phosphorus (white)	7723-14-0	1.0E-01	nc	3.9E-01	nc	2.3E+01	nc	7.4E-03	nc
p-Phthalic acid	100-21-0	4.7E+03	nc	1.6E+04	nc	1.0E+05	max	3.4E+01	nc
Phthalic anhydride	85-44-9	9.7E+03	nc	3.2E+04	nc	1.0E+05	max	4.3E+01	nc
Picloram	1918-02-1	5.0E+02	mcl	1.1E+03	nc	5.3E+04	nc	2.8E+00	mcl
Pirimiphos-methyl	29232-93-7	2.1E-01	nc	1.1E+00	nc	5.3E+01	nc	4.0E-03	nc
Polybrominated biphenyls (PBBs)	59536-65-1	2.6E-03	ca	1.8E-02	ca	7.1E-01	ca	--	

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Polychlorinated biphenyls (PCBs)	1336-36-3	5.0E-01	mcl	2.3E-01	ca	8.6E+00	ca	1.6E+00	mcl
Aroclor 1016	12674-11-2	3.5E-01	nc	1.4E+00	nc	8.2E+01	nc	--	
Aroclor 1221	11104-28-2	4.7E-03	ca	2.0E-01	ca	7.7E+00	ca	1.6E-03	ca
Aroclor 1232	11141-16-5	4.7E-03	ca	1.7E-01	ca	6.7E+00	ca	1.6E-03	ca
Aroclor 1242	53469-21-9	7.9E-03	ca	2.3E-01	ca	8.7E+00	ca	2.5E-02	ca
Aroclor 1248	12672-29-6	7.9E-03	ca	2.3E-01	ca	8.7E+00	ca	2.4E-02	ca
Aroclor 1254	11097-69-1	7.9E-03	ca	2.4E-01	ca	8.9E+00	ca	4.1E-02	ca
Aroclor 1260	11096-82-5	7.9E-03	ca	2.4E-01	ca	9.0E+00	ca	1.1E-01	ca
Polynuclear aromatic hydrocarbons (PAHs)									
Acenaphthene	83-32-9	1.3E+02	nc	9.0E+02	nc	4.1E+04	nc	2.7E+01	nc
Anthracene	120-12-7	4.3E+01	s	4.5E+03	nc	1.0E+05	max	2.9E+02	nc
Benz[a]anthracene	56-55-3	3.0E-02	ca	1.1E+00	ca	1.9E+02	ca	2.1E-01	ca
Benzo[a]pyrene	50-32-8	2.0E-01	mcl	1.1E-01	ca	1.9E+01	ca	4.7E+00	mcl
Benzo[b]fluoranthene	205-99-2	2.5E-01	ca	1.1E+00	ca	1.9E+02	ca	6.0E+00	ca
Benzo[k]fluoranthene	207-08-9	8.0E-01	s	1.1E+01	ca	1.9E+03	ca	5.9E+01	ca
Chrysene	218-01-9	2.0E+00	s	1.1E+02	ca	1.9E+04	ca	1.8E+02	ca
Dibenz[ah]anthracene	53-70-3	2.5E-02	ca	1.1E-01	ca	1.9E+01	ca	1.9E+00	ca
Fluoranthene	206-44-0	2.0E+02	nc	6.0E+02	nc	2.7E+04	nc	4.5E+02	nc
Fluorene	86-73-7	7.4E+01	nc	6.0E+02	nc	2.7E+04	nc	2.7E+01	nc
Indeno[1,2,3-cd]pyrene	193-39-5	1.9E-01	s	1.1E+00	ca	1.9E+02	ca	2.0E+01	ca
Naphthalene	91-20-3	1.7E-01	ca	3.8E+00	ca	1.7E+02	ca	1.1E-02	ca
Pyrene	129-00-0	3.0E+01	nc	4.5E+02	nc	2.1E+04	nc	6.6E+01	nc
Prochloraz	67747-09-5	3.8E-01	ca	3.6E+00	ca	1.4E+02	ca	3.8E-02	ca
Profluralin	26399-36-0	6.5E+00	nc	1.2E+02	nc	7.0E+03	nc	8.0E+00	nc
Prometon	1610-18-0	6.3E+01	nc	2.4E+02	nc	1.1E+04	nc	6.0E-01	nc
Prometryn	7287-19-6	1.5E+02	nc	6.3E+02	nc	3.0E+04	nc	4.5E+00	nc
Propyzamide (Pronamide)	23950-58-5	2.9E+02	nc	1.2E+03	nc	5.7E+04	nc	6.0E+00	nc
Propachlor	1918-16-7	6.1E+01	nc	2.1E+02	nc	9.9E+03	nc	7.5E-01	nc
Propanil	709-98-8	2.0E+01	nc	7.9E+01	nc	3.8E+03	nc	2.3E-01	nc
Propargite	2312-35-8	1.6E-01	ca	2.9E+00	ca	1.1E+02	ca	2.3E-01	ca
Propargyl alcohol	107-19-7	1.0E+01	nc	3.9E+01	nc	2.3E+03	nc	4.1E-02	nc
Propazine	139-40-2	8.6E+01	nc	3.2E+02	nc	1.5E+04	nc	1.5E+00	nc
Propham	122-42-9	8.8E+01	nc	3.2E+02	nc	1.5E+04	nc	1.1E+00	nc
Propiconazole	60207-90-1	4.0E+02	nc	1.6E+03	nc	7.6E+04	nc	2.7E+01	nc
n-Propylbenzene	103-65-1	1.6E+02	nc	9.4E+02	nc	2.4E+04	nc	6.1E+00	nc
Propylene glycol	57-55-6	1.0E+05	nc	1.0E+05	max	1.0E+05	max	4.0E+02	nc
Propylene glycol, monoethyl ether	52125-53-8	8.0E+02	nc	1.0E+04	nc	1.0E+05	max	3.2E+01	nc

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Propylene glycol, monomethyl ether	107-98-2	8.0E+02	nc	1.0E+04	nc	1.0E+05	max	3.2E+00	nc
Propylene oxide	75-56-9	2.7E-01	ca	2.8E+00	ca	1.3E+02	ca	1.1E-02	ca
Pyridine	110-86-1	4.9E+00	nc	2.0E+01	nc	1.2E+03	nc	3.4E-02	nc
Quinalphos	13593-03-8	1.3E+00	nc	7.9E+00	nc	3.8E+02	nc	2.2E-01	nc
Quinoline	91-22-5	2.4E-02	ca	1.8E-01	ca	7.1E+00	ca	1.6E-03	ca
Resmethrin	10453-86-8	1.7E+01	nc	4.7E+02	nc	2.3E+04	nc	2.1E+02	nc
Ronnel	299-84-3	1.0E+02	nc	9.8E+02	nc	5.8E+04	nc	1.9E+01	nc
Rotenone	83-79-4	1.5E+01	nc	6.3E+01	nc	3.0E+03	nc	1.6E+02	nc
Selenious Acid	7783-00-8	2.5E+01	nc	9.8E+01	nc	5.8E+03	nc	--	
Selenium	7782-49-2	5.0E+01	mcl	9.8E+01	nc	5.8E+03	nc	5.2E+00	mcl
Sethoxydim	74051-80-2	4.0E+02	nc	2.2E+03	nc	1.0E+05	max	7.2E+01	nc
Silver and compounds	7440-22-4	1.0E+02	mcl	9.8E+01	nc	5.8E+03	nc	1.7E+01	mcl
Simazine	122-34-9	4.0E+00	mcl	4.5E+00	ca	1.8E+02	ca	3.9E-02	mcl
Sodium azide	26628-22-8	2.0E+01	nc	7.8E+01	nc	4.7E+03	nc	--	
Sodium diethyldithiocarbamate	148-18-5	2.9E-01	ca	2.0E+00	ca	7.9E+01	ca	3.5E-03	ca
Sodium fluoroacetate	62-74-8	1.0E-01	nc	3.2E-01	nc	1.5E+01	nc	4.1E-04	nc
Sodium metavanadate	13718-26-8	5.0E+00	nc	2.0E+01	nc	1.2E+03	nc	--	
Strontium, stable	7440-24-6	3.0E+03	nc	1.2E+04	nc	1.0E+05	max	2.1E+03	nc
Strychnine	57-24-9	1.5E+00	nc	4.7E+00	nc	2.3E+02	nc	3.3E-01	nc
Styrene	100-42-5	1.0E+02	mcl	1.5E+03	nc	3.5E+04	nc	2.2E+00	mcl
1,1'-Sulfonylbis (4-Chlorobenzene)	80-07-9	2.7E+00	nc	1.3E+01	nc	6.1E+02	nc	3.2E-01	nc
Tebuthiuron	34014-18-1	3.4E+02	nc	1.1E+03	nc	5.3E+04	nc	1.9E+00	nc
Temephos	3383-96-8	1.0E+02	nc	3.2E+02	nc	1.5E+04	nc	3.8E+02	nc
Terbacil	5902-51-2	6.3E+01	nc	2.1E+02	nc	9.9E+03	nc	3.8E-01	nc
Terbufos	13071-79-9	5.9E-02	nc	4.9E-01	nc	2.9E+01	nc	2.6E-03	nc
Terbutryn	886-50-0	3.4E+00	nc	1.6E+01	nc	7.6E+02	nc	9.5E-02	nc
1,2,4,5-Tetrachlorobenzene	95-94-3	4.3E-01	nc	5.9E+00	nc	3.5E+02	nc	4.0E-02	nc
2,3,7,8-Tetrachlorodibenzo-p-dioxin (Dioxin)	1746-01-6	3.0E-05	mcl	4.8E-06	ca	2.1E-04	ca	3.0E-04	mcl
1,1,1,2-Tetrachloroethane	630-20-6	5.7E-01	ca	2.0E+00	ca	8.8E+01	ca	4.4E-03	ca
1,1,2,2-Tetrachloroethane	79-34-5	7.6E-02	ca	6.0E-01	ca	2.7E+01	ca	5.9E-04	ca
Tetrachloroethylene (PCE)	127-18-4	5.0E+00	mcl	2.0E+01	nc	3.9E+02	nc	4.5E-02	mcl
2,3,4,6-Tetrachlorophenol	58-90-2	5.9E+01	nc	4.7E+02	nc	2.3E+04	nc	9.0E-01	nc
p,a,a,a-Tetrachlorotoluene	5216-25-1	1.3E-03	ca	3.5E-02	ca	1.6E+00	ca	9.1E-05	ca
Tetrachlorovinphos (Stirofos)	961-11-5	2.8E+00	ca	2.3E+01	ca	8.9E+02	ca	1.6E-01	ca
Tetraethyldithiopyrophosphate	3689-24-5	1.8E+00	nc	7.9E+00	nc	3.8E+02	nc	2.6E-02	nc
Thallium and compounds	7440-28-0	2.0E+00	mcl	2.0E-01	nc	1.2E+01	nc	2.8E+00	mcl
Thiobencarb	28249-77-6	4.0E+01	nc	1.6E+02	nc	7.6E+03	nc	2.8E+00	nc

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE A-1: GROUNDWATER AND SOIL REMEDIATION GOALS

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Thiofanox	39196-18-4	1.3E+00	nc	4.7E+00	nc	2.3E+02	nc	9.1E-03	nc
Thiophanate-methyl	23564-05-8	6.4E+00	ca	4.5E+01	ca	1.8E+03	ca	1.1E-01	ca
Thiram	137-26-8	7.3E+01	nc	2.4E+02	nc	1.1E+04	nc	2.1E+00	nc
Tin and compounds	7440-31-5	3.0E+03	nc	1.2E+04	nc	1.0E+05	max	1.5E+04	nc
Toluene	108-88-3	1.0E+03	mcl	1.2E+03	nc	4.7E+04	nc	1.4E+01	mcl
p-Toluidine	106-49-0	2.5E+00	ca	1.8E+01	ca	7.1E+02	ca	2.1E-02	ca
Tralomethrin	66841-25-6	3.8E+01	nc	1.2E+02	nc	5.7E+03	nc	2.9E+02	nc
Triadimefon (Bayleton)	43121-43-3	1.6E+02	nc	5.4E+02	nc	2.6E+04	nc	2.5E+00	nc
Triallate	2303-17-5	4.7E-01	ca	9.7E+00	ca	4.5E+02	ca	2.1E-02	ca
Triasulfuron	82097-50-5	5.0E+01	nc	1.6E+02	nc	7.6E+03	nc	1.1E+00	nc
Tribenuron-methyl (Express)	101200-48-0	3.9E+01	nc	1.3E+02	nc	6.1E+03	nc	3.0E-01	nc
1,2,4-Tribromobenzene	615-54-3	1.1E+01	nc	9.8E+01	nc	5.8E+03	nc	3.2E-01	nc
Tributyltin oxide (TBTO)	56-35-9	1.4E+00	nc	4.7E+00	nc	2.3E+02	nc	1.5E+03	nc
2,4,6-Trichloroaniline	634-93-5	9.9E-02	nc	4.7E-01	nc	2.3E+01	nc	1.8E-02	nc
2,4,6-Trichloroaniline hydrochloride	33663-50-2	2.7E+00	ca	1.9E+01	ca	7.3E+02	ca	1.5E-01	ca
1,2,4-Trichlorobenzene	120-82-1	7.0E+01	mcl	1.4E+01	nc	2.6E+02	nc	4.1E+00	mcl
1,1,1-Trichloroethane	71-55-6	2.0E+02	mcl	2.0E+03	nc	3.6E+04	nc	1.4E+00	mcl
1,1,2-Trichloroethane	79-00-5	5.0E+00	mcl	3.7E-01	nc	6.3E+00	nc	3.2E-02	mcl
Trichloroethylene (TCE) Long-term +++	79-01-6	5.0E+00	mcl	4.7E-01	ca	1.9E+01	nc	3.6E-02	mcl
Trichlorofluoromethane	75-69-4	1.3E+03	nc	5.9E+03	nc	1.0E+05	max	1.7E+01	nc
2,4,5-Trichlorophenol	95-95-4	3.0E+02	nc	1.6E+03	nc	7.6E+04	nc	2.0E+01	nc
2,4,6-Trichlorophenol	88-06-2	3.0E+00	nc	1.6E+01	nc	7.6E+02	nc	5.8E-02	nc
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	4.1E+01	nc	1.6E+02	nc	7.6E+03	nc	3.4E-01	nc
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	93-72-1	5.0E+01	mcl	1.3E+02	nc	6.1E+03	nc	5.5E-01	mcl
1,1,2-Trichloropropane	598-77-6	2.2E+01	nc	9.8E+01	nc	5.8E+03	nc	1.7E-01	nc
1,2,3-Trichloropropane	96-18-4	7.5E-04	ca	5.1E-03	ca	1.1E+00	ca	6.5E-06	ca
1,2,3-Trichloropropene	96-19-5	1.5E-01	nc	1.8E-01	nc	3.1E+00	nc	1.5E-03	nc
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	2.5E+03	nc	1.7E+03	nc	2.8E+04	nc	1.3E+02	nc
Tridiphane	58138-08-2	4.5E+00	nc	4.7E+01	nc	2.3E+03	nc	6.4E-01	nc
Triethylamine	121-44-8	3.7E+00	nc	2.9E+01	nc	4.8E+02	nc	2.2E-02	nc
Trifluralin	1582-09-8	2.6E+00	ca	9.0E+01	ca	4.2E+03	ca	1.7E+00	ca
1,2,4-Trimethylbenzene	95-63-6	1.4E+01	nc	7.6E+01	nc	1.8E+03	nc	4.0E-01	nc
1,3,5-Trimethylbenzene	108-67-8	1.5E+01	nc	6.8E+01	nc	1.5E+03	nc	4.3E-01	nc
Trimethyl phosphate	512-56-1	3.9E+00	ca	2.7E+01	ca	1.1E+03	ca	1.7E-02	ca
1,3,5-Trinitrobenzene	99-35-4	1.5E+02	nc	5.6E+02	nc	3.2E+04	nc	1.1E+01	nc
Trinitrophenylmethylnitramine (Tetryl)	479-45-8	9.9E+00	nc	3.9E+01	nc	2.3E+03	nc	1.9E+00	nc
2,4,6-Trinitrotoluene (TNT)	118-96-7	2.5E+00	nc	9.1E+00	nc	5.0E+02	nc	2.9E-01	nc

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE A-1: GROUNDWATER AND SOIL REMEDIATION GOALS

CONTAMINANT	CAS No.	Direct Contact Exposure Pathways						Protection of Groundwater	
		Groundwater		Soil				Soil (DAF = 20)	
		Residential TCR=1E-06/ THQ=0.25 (µg/l)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)		Industrial TCR=1E-05/ THQ=1 (mg/kg)		Residential TCR=1E-06/ THQ=0.25 (mg/kg)	
Triphenylphosphine oxide	791-28-6	9.1E+01	nc	3.2E+02	nc	1.5E+04	nc	7.5E+00	nc
Tris(2-chloroethyl) phosphate	115-96-8	3.8E+00	ca	2.7E+01	ca	1.1E+03	ca	7.5E-02	ca
Uranium (chemical toxicity only)	7440-61-0	3.0E+01	mcl	3.9E+00	nc	2.3E+02	nc	2.7E+02	mcl
Vanadium and compounds +++	7440-62-2	2.1E+01	nc	9.8E+01	nc	5.8E+03	nc	4.3E+02	nc
Vernolate (Vernam)	1929-77-7	2.8E+00	nc	2.0E+01	nc	1.2E+03	nc	4.4E-02	nc
Vinclozolin	50471-44-8	5.3E+00	nc	1.9E+01	nc	9.1E+02	nc	8.1E-02	nc
Vinyl acetate	108-05-4	1.0E+02	nc	2.3E+02	nc	3.8E+03	nc	4.4E-01	nc
Vinyl bromide	593-60-2	1.8E-01	ca	1.2E-01	ca	5.2E+00	ca	1.0E-03	ca
Vinyl chloride +++	75-01-4	2.0E+00	mcl	1.1E-01	ca	1.7E+01	ca	1.4E-02	mcl
Warfarin	81-81-2	1.4E+00	nc	4.7E+00	nc	2.3E+02	nc	3.0E-02	nc
Xylenes	1330-20-7	1.0E+04	mcl	1.4E+02	nc	2.5E+03	nc	2.0E+02	mcl
Zinc	7440-66-6	5.0E+03	mcl	5.9E+03	nc	1.0E+05	max	6.2E+03	mcl
Zinc phosphide	1314-84-7	1.5E+00	nc	5.9E+00	nc	3.5E+02	nc	--	
Zineb	12122-67-7	2.5E+02	nc	7.9E+02	nc	3.8E+04	nc	1.4E+01	nc

Notes:

* At VCP sites where chromium is a potential contaminant of concern, such as a former metal plating facility, the VCP applicant should collect media samples for both chromium III and chromium VI analyses.

^^ If both PFOS and PFOA are present, the sum of the concentrations for these contaminants should not exceed 0.07 µg/L.

+++ See Section 5.4 of Appendix A, Protocol for VCP Remediation Goal Lookup Tables, Nebraska Voluntary Cleanup Program for more information.

-- = Not available/not applicable
µg/L = Micrograms per liter
ca = cancer
CAS No. = Chemical Abstract Service Number
DAF = Dilution attenuation factor
hal = health advisory limit
max = maximum (saturation value)
mcl = Maximum Contaminant Level
nc = noncancer
NDEQ = Nebraska Department of Enviromental Quality policy value

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE A-2: INDOOR AIR, SOIL GAS, and GROUNDWATER VAPOR INTRUSION REMEDIATION GOALS

Version Date: September 2018

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)		Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)		Residential TCR=1E-06/ THQ=0.25 ($\mu g/l$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/l$)	Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)
Acephate	30560-19-1	--		--		--	--	--	--
Acetaldehyde	75-07-0	1.3E+00	ca	3.9E+01	nc	7.9E+02	2.4E+04	4.3E+01	1.3E+03
Acetochlor	34256-82-1	--		--		--	--	--	--
Acetone	67-64-1	8.1E+03	nc	1.4E+05	nc	1.1E+07	1.8E+08	2.7E+05	4.5E+06
Acetone cyanohydrin	75-86-5	5.2E-01	nc	8.8E+00	nc	--	--	--	--
Acetonitrile	75-05-8	1.6E+01	nc	2.6E+02	nc	2.1E+04	3.5E+05	5.2E+02	8.8E+03
Acrolein	107-02-8	5.2E-03	nc	8.8E-02	nc	1.9E+00	3.2E+01	1.7E-01	2.9E+00
Acrylamide	79-06-1	1.0E-02	ca	1.2E+00	ca	--	--	--	--
Acrylic acid	79-10-7	2.6E-01	nc	4.4E+00	nc	5.2E+04	8.8E+05	8.7E+00	1.5E+02
Acrylonitrile	107-13-1	4.1E-02	ca	1.8E+00	ca	1.5E+01	6.7E+02	1.4E+00	6.0E+01
Alachlor	15972-60-8	--		--		--	--	--	--
Aldicarb	116-06-3	--		--		--	--	--	--
Aldicarb sulfone	1646-88-4	--		--		--	--	--	--
Aldrin	309-00-2	5.7E-04	ca	2.5E-02	ca	1.4E+00	NVT	1.9E-02	8.3E-01
Allyl alcohol	107-18-6	2.6E-02	nc	4.4E-01	nc	3.3E+02	5.5E+03	8.7E-01	1.5E+01
Allyl chloride	107-05-1	2.6E-01	nc	4.4E+00	nc	1.1E+00	1.8E+01	8.7E+00	1.5E+02
Aluminum	7429-90-5	1.3E+00	nc	2.2E+01	nc	--	--	--	--
Aluminum phosphide	20859-73-8	--		--		--	--	--	--
Ametryn	834-12-8	--		--		--	--	--	--
m-Aminophenol	591-27-5	--		--		--	--	--	--
Amitraz	33089-61-1	--		--		--	--	--	--
Ammonia +++	7664-41-7	1.3E+02	nc	2.2E+03	nc	3.0E+05	5.1E+06	4.3E+03	7.3E+04
Ammonium sulfamate	7773-06-0	--		--		--	--	--	--
Aniline	62-53-3	2.6E-01	nc	4.4E+00	nc	--	--	--	--
Antimony and compounds	7440-36-0	--		--		--	--	--	--
Antimony pentoxide	1314-60-9	--		--		--	--	--	--
Antimony potassium tartrate	28300-74-5	--		--		--	--	--	--
Antimony tetroxide	1332-81-6	--		--		--	--	--	--
Antimony trioxide	1309-64-4	5.2E-02	nc	8.8E-01	nc	--	--	--	--
Arsenic (inorganic) +++	7440-38-2	--		--		--	--	--	--
Arsine	7784-42-1	1.3E-02	nc	2.2E-01	nc	--	--	--	--
Assure	76578-14-8	--		--		--	--	--	--
Asulam	3337-71-1	--		--		--	--	--	--
Atrazine	1912-24-9	--		--		--	--	--	--
Avermectin B1	65195-55-3	--		--		--	--	--	--

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE A-2: INDOOR AIR, SOIL GAS, and GROUNDWATER VAPOR INTRUSION REMEDIATION GOALS

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)		Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)		Residential TCR=1E-06/ THQ=0.25 ($\mu g/l$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/l$)	Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)
Azobenzene	103-33-3	9.1E-02	ca	4.0E+00	ca	1.6E+02	NVT	3.0E+00	1.3E+02
Barium and compounds	7440-39-3	1.3E-01	nc	2.2E+00	nc	--	--	--	--
Benfluralin (Benefin)	1861-40-1	--		--		--	--	--	--
Bensulfuron-methyl (Londax)	83055-99-6	--		--		--	--	--	--
Bentazone (Bentazon)	25057-89-0	--		--		--	--	--	--
Benzaldehyde	100-52-7	--		--		--	NVT	--	--
Benzene	71-43-2	3.6E-01	ca	1.6E+01	ca	3.1E+00	1.4E+02	1.2E+01	5.2E+02
Benzidine	92-87-5	1.5E-05	ca	1.8E-03	ca	--	--	--	--
Benzoic acid	65-85-0	--		--		--	--	--	--
Benzotrichloride	98-07-7	--		--		--	--	--	--
Benzyl alcohol	100-51-6	--		--		--	--	--	--
Benzyl chloride	100-44-7	5.7E-02	ca	2.5E+00	ca	8.3E+00	3.6E+02	1.9E+00	8.3E+01
Beryllium and compounds	7440-41-7	1.2E-03	ca	5.1E-02	ca	--	--	--	--
Biphenthrin (Talstar)	82657-04-3	--		--		--	--	--	--
1,1-Biphenyl	92-52-4	1.0E-01	nc	1.8E+00	nc	2.7E+01	4.5E+02	3.5E+00	5.8E+01
Bis(2-chloroethyl)ether	111-44-4	8.5E-03	ca	3.7E-01	ca	3.8E+01	1.7E+03	2.8E-01	1.2E+01
Bis(chloromethyl)ether	542-88-1	4.5E-05	ca	2.0E-03	ca	2.5E-04	1.1E-02	1.5E-03	6.6E-02
Bis(2-chloro-1-methylethyl)ether	108-60-1	--		--		--	--	--	--
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	1.2E+00	ca	5.1E+01	ca	--	--	--	--
Bisphenol A	80-05-7	--		--		--	--	--	--
Boron	7440-42-8	5.2E+00	nc	8.8E+01	nc	--	--	--	--
Boron trifluoride	7637-07-2	3.4E+00	nc	5.7E+01	nc	No HLC	No HLC	1.1E+02	1.9E+03
Bromate	15541-45-4	--		--		--	--	--	--
Bromobenzene	108-86-1	1.6E+01	nc	2.6E+02	nc	4.4E+02	7.4E+03	5.2E+02	8.8E+03
Bromodichloromethane	75-27-4	7.6E-02	ca	3.3E+00	ca	1.8E+00	7.9E+01	2.5E+00	1.1E+02
Bromoform (Tribromomethane)	75-25-2	2.6E+00	ca	1.1E+02	ca	3.0E+02	1.3E+04	8.5E+01	3.7E+03
Bromomethane	74-83-9	1.3E+00	nc	2.2E+01	nc	6.9E+00	1.2E+02	4.3E+01	7.3E+02
Bromophos	2104-96-3	--		--		--	--	--	--
Bromoxynil	1689-84-5	--		--		--	--	--	--
Bromoxynil octanoate	1689-99-2	--		--		--	--	--	--
1,3-Butadiene	106-99-0	9.4E-02	ca	4.1E+00	ca	--	--	3.1E+00	1.4E+02
1-Butanol	71-36-3	--		--		--	--	--	--
Butylate	2008-41-5	--		--		--	--	--	--
Butyl benzyl phthalate	85-68-7	--		--		--	--	--	--
Butylphthalyl butylglycolate	85-70-1	--		--		--	--	--	--
Cacodylic acid	75-60-5	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)		Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)		Residential TCR=1E-06/ THQ=0.25 ($\mu g/l$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/l$)	Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)
Cadmium and compounds +++	7440-43-9	1.6E-03	ca	4.4E-02	nc	--	--	--	--
Camphechlor (Toxaphene)	8001-35-2	8.8E-03	ca	3.8E-01	ca	--	--	--	--
Caprolactam	105-60-2	5.7E-01	nc	9.6E+00	nc	--	--	--	--
Captafol	2425-06-1	6.5E-02	ca	2.9E+00	ca	--	--	--	--
Captan	133-06-2	4.3E+00	ca	1.9E+02	ca	--	--	--	--
Carbaryl	63-25-2	--		--		--	--	--	--
Carbofuran	1563-66-2	--		--		--	--	--	--
Carbon disulfide	75-15-0	1.8E+02	nc	3.1E+03	nc	5.4E+02	9.1E+03	6.1E+03	1.0E+05
Carbon tetrachloride	56-23-5	4.7E-01	ca	2.0E+01	ca	8.0E-01	3.5E+01	1.6E+01	6.8E+02
Carbosulfan	55285-14-8	--		--		--	--	--	--
Carboxin	5234-68-4	--		--		--	--	--	--
Chloramben	133-90-4	--		--		--	--	--	--
Chloranil	118-75-2	--		--		--	--	--	--
Chlordane	12789-03-6	2.8E-02	ca	1.2E+00	ca	NVT	NVT	9.4E-01	4.1E+01
Chlordecone (Kepone)	143-50-0	6.1E-04	ca	2.7E-02	ca	--	--	--	--
Chlorimuron-ethyl	90982-32-4	--		--		--	--	--	--
Chlorine	7782-50-5	3.9E-02	nc	6.6E-01	nc	1.5E+01	2.5E+02	1.3E+00	2.2E+01
Chlorine dioxide	10049-04-4	5.2E-02	nc	8.8E-01	nc	No S	No S	1.7E+00	2.9E+01
Chloroacetic acid	79-11-8	--		--		--	--	--	--
2-Chloroacetophenone	532-27-4	7.8E-03	nc	1.3E-01	nc	--	--	--	--
4-Chloroaniline	106-47-8	--		--		--	--	--	--
Chlorobenzene	108-90-7	1.3E+01	nc	2.2E+02	nc	NVT	NVT	4.3E+02	7.3E+03
Chlorobenzilate	510-15-6	9.1E-02	ca	4.0E+00	ca	--	--	--	--
p-Chlorobenzoic acid	74-11-3	--		--		--	--	--	--
4-Chlorobenzotrifluoride	98-56-6	7.8E+01	nc	1.3E+03	nc	--	--	2.6E+03	4.4E+04
2-Chloro-1,3-butadiene	126-99-8	9.4E-03	ca	4.1E-01	ca	8.4E-03	3.7E-01	3.1E-01	1.4E+01
1-Chlorobutane	109-69-3	--		--		--	--	--	--
1-Chloro-1,1-difluoroethane	75-68-3	1.3E+04	nc	2.2E+05	nc	3.6E+05	NVT	4.3E+05	7.3E+06
Chlorodifluoromethane	75-45-6	1.3E+04	nc	2.2E+05	nc	1.1E+04	1.9E+05	4.3E+05	7.3E+06
2-Chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester sulfurous acid (Aramite)	140-57-8	4.0E-01	ca	1.7E+01	ca	--	--	--	--
Chloroform	67-66-3	1.2E-01	ca	5.3E+00	ca	1.5E+00	6.7E+01	4.1E+00	1.8E+02
Chloromethane	74-87-3	2.3E+01	nc	3.9E+02	nc	9.7E+01	1.6E+03	7.8E+02	1.3E+04
4-Chloro-2-methylaniline hydrochloride	3165-93-3	--		--		--	--	--	--
beta-Chloronaphthalene	91-58-7	--		--		--	--	--	--
o-Chloronitrobenzene	88-73-3	2.6E-03	nc	4.4E-02	nc	--	NVT	--	--
p-Chloronitrobenzene	100-00-5	5.2E-01	nc	8.8E+00	nc	--	--	--	--

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE A-2: INDOOR AIR, SOIL GAS, and GROUNDWATER VAPOR INTRUSION REMEDIATION GOALS

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)		Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)		Residential TCR=1E-06/ THQ=0.25 ($\mu g/l$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/l$)	Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)
2-Chlorophenol	95-57-8	--		--		--	--	--	--
Chlorothalonil	1897-45-6	3.2E+00	ca	1.4E+02	ca	--	--	--	--
o-Chlorotoluene	95-49-8	--		--		--	--	--	--
Chlorpropham	101-21-3	--		--		--	--	--	--
Chlorpyrifos	2921-88-2	--		--		--	--	--	--
Chlorpyrifos-methyl	5598-13-0	--		--		--	--	--	--
Chlorsulfuron	64902-72-3	--		--		--	--	--	--
Chlorthiophos	60238-56-4	--		--		--	--	--	--
Chromium, Total	7440-47-3	--		--		--	--	--	--
Chromium III *	16065-83-1	--		--		--	--	--	--
Chromium VI +++	18540-29-9	1.2E-05	ca	1.5E-03	ca	--	--	--	--
Clofentezine (Apollo)	74115-24-5	--		--		--	--	--	--
Cobalt	7440-48-4	3.1E-04	ca	1.4E-02	ca	--	--	--	--
Coke Oven Emissions	7440-47-3	--		--		--	--	--	--
Copper and compounds	7440-50-8	--		--		--	--	--	--
Crotonaldehyde	123-73-9	--		--		--	--	--	--
Cumene (Isopropylbenzene)	98-82-8	1.0E+02	nc	1.8E+03	nc	6.3E+02	1.1E+04	3.5E+03	5.8E+04
Cyanazine	21725-46-2	--		--		--	--	--	--
Cyanide (free)	57-12-5	2.1E-01	nc	3.5E+00	nc	5.0E+01	8.4E+02	7.0E+00	1.2E+02
Cyanide (hydrogen)	74-90-8	2.1E-01	nc	3.5E+00	nc	--	--	--	--
Cyanogen	460-19-5	--		--		--	--	--	--
Cyanogen bromide	506-68-3	--		--		--	--	--	--
Cyanogen chloride	506-77-4	--		--		--	--	--	--
Cyclohexane	110-82-7	1.6E+03	nc	2.6E+04	nc	4.9E+02	8.3E+03	5.2E+04	8.8E+05
Cyclohexanone	108-94-1	1.8E+02	nc	3.1E+03	nc	1.5E+06	NVT	6.1E+03	1.0E+05
Cyclohexylamine	108-91-8	--		--		--	--	--	--
Cyfluthrin (Baythroid)	68359-37-5	--		--		--	--	--	--
Cyhalothrin (Karate)	68085-85-8	--		--		--	--	--	--
Cyromazine	66215-27-8	--		--		--	--	--	--
Dacthal	1861-32-1	--		--		--	NVT	--	--
Dalapon	75-99-0	--		--		--	--	--	--
Daminozide (Alar)	1596-84-5	5.5E-01	ca	2.4E+01	ca	--	--	--	--
Demeton	8065-48-3	--		--		--	--	--	--
Diallate	2303-16-4	--		--		--	--	--	--
Diazinon	333-41-5	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)		Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)		Residential TCR=1E-06/ THQ=0.25 ($\mu g/l$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/l$)	Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)
Dibenzofuran	132-64-9	--		--		--	--	--	--
1,4-Dibromobenzene	106-37-6	--		--		--	--	--	--
Dibromochloromethane	124-48-1	--		--		--	--	--	--
1,2-Dibromo-3-chloropropane	96-12-8	1.7E-04	ca	2.0E-02	ca	7.9E-02	9.6E+00	5.6E-03	6.8E-01
1,2-Dibromoethane	106-93-4	4.7E-03	ca	2.0E-01	ca	4.1E-01	1.8E+01	1.6E-01	6.8E+00
Dibutyl phthalate	84-74-2	--		--		NVT	NVT	--	--
Dicamba	1918-00-9	--		--		--	--	--	--
1,2-Dichlorobenzene	95-50-1	5.2E+01	nc	8.8E+02	nc	1.8E+03	2.9E+04	1.7E+03	2.9E+04
1,4-Dichlorobenzene	106-46-7	2.6E-01	ca	1.1E+01	ca	6.6E+00	2.9E+02	8.5E+00	3.7E+02
3,3-Dichlorobenzidine	91-94-1	8.3E-03	ca	3.6E-01	ca	--	--	--	--
4,4'-Dichlorobenzophenone	90-98-2	--		--		--	--	--	--
1,4-Dichloro-2-butene	764-41-0	6.7E-04	ca	2.9E-02	ca	1.9E-03	8.4E-02	2.2E-02	9.7E-01
Dichlorodifluoromethane	75-71-8	2.6E+01	nc	4.4E+02	nc	3.7E+00	6.3E+01	8.7E+02	1.5E+04
p,p'-Dichlorodiphenyldichloroethane (DDD)	72-54-8	4.1E-02	ca	1.8E+00	ca	--	--	--	--
p,p'-Dichlorodiphenyldichloroethylene (DDE)	72-55-9	2.9E-02	ca	1.3E+00	ca	NVT	NVT	9.6E-01	4.2E+01
p,p'-Dichlorodiphenyltrichloroethane (DDT)	50-29-3	2.9E-02	ca	1.3E+00	ca	--	--	--	--
1,1-Dichloroethane	75-34-3	1.8E+00	ca	7.7E+01	ca	1.4E+01	6.2E+02	5.8E+01	2.6E+03
1,2-Dichloroethane	107-06-2	1.1E-01	ca	4.7E+00	ca	4.5E+00	2.0E+02	3.6E+00	1.6E+02
1,1-Dichloroethylene	75-35-4	5.2E+01	nc	8.8E+02	nc	8.3E+01	1.4E+03	1.7E+03	2.9E+04
1,2-Dichloroethylene (cis)	156-59-2	--		--		--	--	--	--
1,2-Dichloroethylene (trans)	156-60-5	--		--		--	--	--	--
2,4-Dichlorophenol	120-83-2	--		--		--	--	--	--
2,4-Dichlorophenoxy acetic acid (2,4-D)	94-75-7	--		--		--	--	--	--
2,4-Dichlorophenoxy butyric acid (2,4-DB)	94-82-6	--		--		--	--	--	--
Decabromodiphenyl ether (BDE-209)	1163-19-5	--		--		--	--	--	--
1,2-Dichloropropane	78-87-5	7.5E-01	ca	1.8E+01	nc	1.3E+01	3.1E+02	2.5E+01	5.8E+02
2,3-Dichloropropanol	616-23-9	--		--		--	--	--	--
1,3-Dichloropropene	542-75-6	7.0E-01	ca	3.1E+01	ca	1.0E+01	4.5E+02	2.3E+01	1.0E+03
Dichlorvos	62-73-7	3.4E-02	ca	1.5E+00	ca	--	--	--	--
Dicrotophos (Bidrin)	141-66-2	--		--		--	--	--	--
Dicyclopentadiene	77-73-6	7.8E-02	nc	1.3E+00	nc	3.8E-02	6.4E-01	2.6E+00	4.4E+01
Dieldrin	60-57-1	6.1E-04	ca	2.7E-02	ca	--	--	--	--
Diethylene glycol, monobutyl ether	112-34-5	2.6E-02	nc	4.4E-01	nc	--	--	--	--
Diethylene glycol, monoethyl ether	111-90-0	7.8E-02	nc	1.3E+00	nc	--	--	--	--
Diethylformamide	617-84-5	--		--		--	--	--	--
Di(2-ethylhexyl)adipate	103-23-1	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 (µg/m^3)		Industrial TCR=1E-05/ THQ=1 (µg/m^3)		Residential TCR=1E-06/ THQ=0.25 (µg/l)	Industrial TCR=1E-05/ THQ=1 (µg/l)	Residential TCR=1E-06/ THQ=0.25 (µg/m^3)	Industrial TCR=1E-05/ THQ=1 (µg/m^3)
Diethyl phthalate	84-66-2	--		--		--	--	--	--
Diethylstilbestrol	56-53-1	2.8E-05	ca	1.2E-03	ca	--	--	--	--
Difenzoquat (Avenge)	43222-48-6	--		--		--	--	--	--
Diflubenzuron	35367-38-5	--		--		--	--	--	--
1,1-Difluoroethane	75-37-6	1.0E+04	nc	1.8E+05	nc	1.8E+04	3.1E+05	3.5E+05	5.8E+06
Diisopropyl methylphosphonate (DIMP)	1445-75-6	--		--		--	--	--	--
Dimethipin	55290-64-7	--		--		--	--	--	--
Dimethoate	60-51-5	--		--		--	--	--	--
3,3'-Dimethoxybenzidine	119-90-4	--		--		--	--	--	--
N-N-Dimethylaniline	121-69-7	--		--		--	--	--	--
2,4-Dimethylaniline	95-68-1	--		--		--	--	--	--
2,4-Dimethylaniline hydrochloride	21436-96-4	--		--		--	--	--	--
3,3'-Dimethylbenzidine	119-93-7	--		--		--	--	--	--
N,N-Dimethylformamide	68-12-2	7.8E+00	nc	1.3E+02	nc	8.1E+06	1.4E+08	2.6E+02	4.4E+03
2,4-Dimethylphenol	105-67-9	--		--		--	--	--	--
2,6-Dimethylphenol	576-26-1	--		--		--	--	--	--
3,4-Dimethylphenol	95-65-8	--		--		--	--	--	--
Dimethyl terephthalate	120-61-6	--		--		--	--	--	--
4,6-Dinitro-o-cyclohexyl phenol	131-89-5	--		--		--	--	--	--
1,2-Dinitrobenzene	528-29-0	--		--		--	--	--	--
1,3-Dinitrobenzene	99-65-0	--		--		--	--	--	--
1,4-Dinitrobenzene	100-25-4	--		--		--	--	--	--
2,4-Dinitrophenol	51-28-5	--		--		--	--	--	--
Dinitrotoluene mixture	25321-14-6	--		--		--	--	--	--
2,4-Dinitrotoluene	121-14-2	3.2E-02	ca	1.4E+00	ca	--	--	--	--
2,6-Dinitrotoluene	606-20-2	--		--		--	--	--	--
Dinoseb	88-85-7	--		--		--	--	--	--
1,4-Dioxane	123-91-1	5.6E-01	ca	2.5E+01	ca	6.5E+03	2.8E+05	1.9E+01	8.2E+02
Diphenamid	957-51-7	--		--		--	--	--	--
Diphenylamine	122-39-4	--		--		--	--	--	--
N,N-Diphenyl-1,4 benzenediamine (DPPD)	74-31-7	--		--		--	--	--	--
1,2-Diphenylhydrazine	122-66-7	1.3E-02	ca	5.6E-01	ca	--	--	--	--
Diphenyl sulfone	127-63-9	--		--		--	--	--	--
Diquat dibromide (Diquat)	85-00-7	--		--		--	--	--	--
Direct black 38	1937-37-7	2.0E-05	ca	8.8E-04	ca	--	--	--	--
Direct blue 6	2602-46-2	2.0E-05	ca	8.8E-04	ca	--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 (µg/m^3)		Industrial TCR=1E-05/ THQ=1 (µg/m^3)		Residential TCR=1E-06/ THQ=0.25 (µg/l)	Industrial TCR=1E-05/ THQ=1 (µg/l)	Residential TCR=1E-06/ THQ=0.25 (µg/m^3)	Industrial TCR=1E-05/ THQ=1 (µg/m^3)
Direct brown 95	16071-86-6	2.0E-05	ca	8.8E-04	ca	--	--	--	--
Disulfoton	298-04-4	--		--		--	--	--	--
1,4-Dithiane	505-29-3	--		--		--	--	--	--
Diuron	330-54-1	--		--		--	--	--	--
Dodine	2439-10-3	--		--		--	--	--	--
Endosulfan	115-29-7	--		--		--	--	--	--
Endothall	145-73-3	--		--		--	--	--	--
Endrin	72-20-8	--		--		--	--	--	--
Enilconazole (Imazalil)	35554-44-0	--		--		--	--	--	--
Epichlorohydrin	106-89-8	2.6E-01	nc	4.4E+00	nc	2.1E+02	3.5E+03	8.7E+00	1.5E+02
1,2-Epoxybutane	106-88-7	5.2E+00	nc	8.8E+01	nc	1.4E+03	2.3E+04	1.7E+02	2.9E+03
S-Ethyl dipropylthiocarbamate (EPTC)	759-94-4	--		--		--	--	--	--
2-Chloroethyl phosphonic acid (Ethephon)	16672-87-0	--		--		--	--	--	--
Ethion	563-12-2	--		--		--	--	--	--
2-Ethoxyethanol	110-80-5	5.2E+01	nc	8.8E+02	nc	7.1E+06	1.2E+08	1.7E+03	2.9E+04
2-Ethoxyethanol acetate	111-15-9	1.6E+01	nc	2.6E+02	nc	3.4E+05	5.7E+06	5.2E+02	8.8E+03
Ethyl acetate	141-78-6	1.8E+01	nc	3.1E+02	nc	6.8E+03	1.1E+05	6.1E+02	1.0E+04
Ethyl acrylate	140-88-5	2.1E+00	nc	3.5E+01	nc	3.7E+02	6.2E+03	7.0E+01	1.2E+03
Ethylbenzene	100-41-4	1.1E+00	ca	4.9E+01	ca	8.1E+00	3.5E+02	3.7E+01	1.6E+03
Ethyl chloride (Chloroethane)	75-00-3	2.6E+03	nc	4.4E+04	nc	9.4E+03	1.6E+05	8.7E+04	1.5E+06
Ethylene cyanohydrin	109-78-4	--		--		--	--	--	--
Ethylene diamine	107-15-3	--		--		--	--	--	--
Ethylene glycol	107-21-1	1.0E+02	nc	1.8E+03	nc	--	--	--	--
Ethylene glycol, monobutyl ether	111-76-2	4.2E+02	nc	7.0E+03	nc	--	--	--	--
Ethylene oxide	75-21-8	3.4E-04	ca	4.1E-02	ca	9.3E-02	1.1E+01	1.1E-02	1.4E+00
Ethylene thiourea (ETU)	96-45-7	2.2E-01	ca	9.4E+00	ca	--	--	--	--
Ethyl ether	60-29-7	--		--		--	--	--	--
Ethyl methacrylate	97-63-2	7.8E+01	nc	1.3E+03	nc	9.9E+03	1.7E+05	2.6E+03	4.4E+04
Ethyl p-nitrophenyl phenylphosphorothioate (EPN)	2104-64-5	--		--		--	--	--	--
Ethylphthalyl ethyl glycolate	84-72-0	--		--		--	--	--	--
Fenamiphos	22224-92-6	--		--		--	--	--	--
Fenpropathrin (Danitol)	39515-41-8	--		--		--	--	--	--
Fenvalerate (Pydrin)	51630-58-1	--		--		--	--	--	--
Fluometuron	2164-17-2	--		--		--	--	--	--
Fluoride	16984-48-8	3.4E+00	nc	5.7E+01	nc	--	--	--	--
Fluoridone	59756-60-4	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 (µg/m^3)		Industrial TCR=1E-05/ THQ=1 (µg/m^3)		Residential TCR=1E-06/ THQ=0.25 (µg/l)	Industrial TCR=1E-05/ THQ=1 (µg/l)	Residential TCR=1E-06/ THQ=0.25 (µg/m^3)	Industrial TCR=1E-05/ THQ=1 (µg/m^3)
Flurprimidol	56425-91-3	--		--		--	--	--	--
Flusilazole (NuStar)	85509-19-9	--		--		--	--	--	--
Flutolanil	66332-96-5	--		--		--	--	--	--
Fluvalinate	69409-94-5	--		--		--	--	--	--
Folpet	133-07-3	--		--		--	--	--	--
Fomesafen	72178-02-0	--		--		--	--	--	--
Fonofos	944-22-9	--		--		--	--	--	--
Formaldehyde	50-00-0	2.2E-01	ca	9.4E+00	ca	2.5E+04	1.1E+06	7.2E+00	3.1E+02
Formic acid	64-18-6	7.8E-02	nc	1.3E+00	nc	1.8E+04	3.0E+05	2.6E+00	4.4E+01
Fosetyl-al	39148-24-8	--		--		--	--	--	--
Furan	110-00-9	--		--		--	--	--	--
Furazolidone	67-45-8	--		--		--	--	--	--
Furfural	98-01-1	1.3E+01	nc	2.2E+02	nc	2.1E+05	3.6E+06	4.3E+02	7.3E+03
Furmecyclox	60568-05-0	3.3E-01	ca	1.4E+01	ca	--	--	--	--
Furothiazole (Furium)	531-82-8	6.5E-03	ca	2.9E-01	ca	--	--	--	--
Glufosinate-ammonium	77182-82-2	--		--		--	--	--	--
Glycidaldehyde	765-34-4	2.6E-01	nc	4.4E+00	nc	1.2E+04	2.1E+05	8.7E+00	1.5E+02
Glyphosate	1071-83-6	--		--		--	--	--	--
Haloxyfop-methyl	69806-40-2	--		--		--	--	--	--
Thifensulfuron-methyl (Harmony)	79277-27-3	--		--		--	--	--	--
Heptachlor	76-44-8	2.2E-03	ca	9.4E-02	ca	7.4E-01	3.2E+01	7.2E-02	3.1E+00
Heptachlor epoxide	1024-57-3	1.1E-03	ca	4.7E-02	ca	7.3E+00	NVT	3.6E-02	1.6E+00
Hexabromobenzene	87-82-1	--		--		--	--	--	--
Hexachlorobenzene	118-74-1	6.1E-03	ca	2.7E-01	ca	3.2E-01	NVT	2.0E-01	8.9E+00
Hexachlorobutadiene	87-68-3	1.3E-01	ca	5.6E+00	ca	8.8E-01	NVT	4.3E+00	1.9E+02
alpha-Hexachlorocyclohexane (alpha-HCH)	319-84-6	1.6E-03	ca	6.8E-02	ca	--	--	--	--
beta-Hexachlorocyclohexane (beta-HCH)	319-85-7	5.3E-03	ca	2.3E-01	ca	--	NVT	--	--
gamma-Hexachlorocyclohexane (Lindane)	58-89-9	9.1E-03	ca	4.0E-01	ca	--	--	--	--
Hexachlorocyclohexane technical	608-73-1	5.5E-03	ca	2.4E-01	ca	--	--	--	--
Hexachlorocyclopentadiene	77-47-4	5.2E-02	nc	8.8E-01	nc	4.5E+00	7.5E+01	1.7E+00	2.9E+01
Hexachloroethane	67-72-1	2.6E-01	ca	1.1E+01	ca	5.2E+00	2.3E+02	8.5E+00	3.7E+02
Hexachlorophene	70-30-4	--		--		--	--	--	--
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX/Cyclonite)	121-82-4	--		--		--	--	--	--
1,6-Hexamethylene diisocyanate	822-06-0	2.6E-03	nc	4.4E-02	nc	1.3E+00	2.2E+01	8.7E-02	1.5E+00
n-Hexane	110-54-3	1.8E+02	nc	3.1E+03	nc	4.7E+00	7.9E+01	6.1E+03	1.0E+05
Hexazinone	51235-04-2	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)		Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)		Residential TCR=1E-06/ THQ=0.25 ($\mu g/l$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/l$)	Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)
Hexythiazox (Savey)	78587-05-0	--		--		--	--	--	--
Hydramethylnon (Amdro)	67485-29-4	--		--		--	--	--	--
Hydrazine, hydrazine sulfate	302-01-2	5.7E-04	ca	2.5E-02	ca	6.2E+01	2.7E+03	1.9E-02	8.3E-01
Hydrazine, dimethyl	57-14-7	5.2E-04	nc	8.8E-03	nc	2.0E+00	3.4E+01	1.7E-02	2.9E-01
Hydrogen chloride	7647-01-0	5.2E+00	nc	8.8E+01	nc	7.8E-08	1.3E-06	1.7E+02	2.9E+03
Hydrogen sulfide	7783-06-4	5.2E-01	nc	8.8E+00	nc	2.0E+00	3.4E+01	1.7E+01	2.9E+02
p-Hydroquinone	123-31-9	--		--		--	--	--	--
Imazaquin	81335-37-7	--		--		--	--	--	--
Imazethapyr (Pursuit)	81335-77-5	--		--		--	--	--	--
Iprodione	36734-19-7	--		--		--	--	--	--
Iron	7439-89-6	--		--		--	--	--	--
Isobutanol (Isobutyl alcohol)	78-83-1	--		--		--	--	--	--
Isophorone	78-59-1	5.2E+02	nc	8.8E+03	nc	--	--	--	--
Isopropalin	33820-53-0	--		--		--	--	--	--
Isopropyl methyl phosphonic acid	1832-54-8	--		--		--	--	--	--
Isoxaben	82558-50-7	--		--		--	--	--	--
Lactofen	77501-63-4	--		--		--	--	--	--
Lead +++	7439-92-1	--		--		--	--	--	--
Lead (tetraethyl)	78-00-2	--		--		--	--	--	--
Linuron	330-55-2	--		--		--	--	--	--
Lithium	7439-93-2	--		--		--	--	--	--
Malathion	121-75-5	--		--		--	--	--	--
Maleic anhydride	108-31-6	1.8E-01	nc	3.1E+00	nc	--	--	--	--
Maleic hydrazide	123-33-1	--		--		--	--	--	--
Malononitrile	109-77-3	--		--		--	--	--	--
Mancozeb	8018-01-7	--		--		--	--	--	--
Maneb	12427-38-2	--		--		--	--	--	--
Manganese (non-food) +++	7439-96-5	1.3E-02	nc	2.2E-01	nc	--	--	--	--
Mephosfolan	950-10-7	--		--		--	--	--	--
Mepiquat chloride (Mepiquat)	24307-26-4	--		--		--	--	--	--
Mercury and compounds	7487-94-7	7.8E-02	nc	1.3E+00	nc	--	--	--	--
Mercury (elemental)	7439-97-6	7.8E-02	nc	1.3E+00	nc	7.3E-01	1.2E+01	2.6E+00	4.4E+01
Mercury (methyl)	22967-92-6	--		--		--	--	--	--
Merphos	150-50-5	--		--		--	--	--	--
Merphos oxide	78-48-8	--		--		--	--	--	--
Metalaxyl	57837-19-1	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)		Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)		Residential TCR=1E-06/ THQ=0.25 ($\mu g/l$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/l$)	Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)
Methacrylonitrile	126-98-7	7.8E+00	nc	1.3E+02	nc	1.6E+03	2.7E+04	2.6E+02	4.4E+03
Methamidophos	10265-92-6	--		--		--	--	--	--
Methanol	67-56-1	5.2E+03	nc	8.8E+04	nc	6.4E+07	NVT	1.7E+05	2.9E+06
Methidathion	950-37-8	--		--		--	--	--	--
Methomyl	16752-77-5	--		--		--	--	--	--
Methoxychlor	72-43-5	--		--		--	--	--	--
2-Methoxyethanol	109-86-4	5.2E+00	nc	8.8E+01	nc	9.3E+05	NVT	1.7E+02	2.9E+03
2-Methoxyethanol acetate	110-49-6	2.6E-01	nc	4.4E+00	nc	5.9E+04	9.9E+05	8.7E+00	1.5E+02
2-Methoxy-5-nitroaniline	99-59-2	2.0E-01	ca	8.8E+00	ca	--	--	--	--
Methyl acetate	79-20-9	--		--		--	--	--	--
Methyl acrylate	96-33-3	5.2E+00	nc	8.8E+01	nc	1.3E+03	2.2E+04	1.7E+02	2.9E+03
2-Methylaniline hydrochloride	636-21-5	7.6E-02	ca	3.3E+00	ca	--	--	--	--
Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	17804-35-2	--		--		--	--	--	--
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	94-74-6	--		--		--	--	--	--
4-(2-Methyl-4-chlorophenoxy) butyric acid (MCPB)	94-81-5	--		--		--	--	--	--
2-(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)	93-65-2	--		--		--	--	--	--
4,4'-Methylenebisbenzeneamine	101-77-9	6.1E-03	ca	2.7E-01	ca	--	--	--	--
4,4'-Methylene bis(2-chloroaniline)	101-14-4	2.4E-03	ca	2.9E-01	ca	--	--	--	--
4,4'-Methylene bis(N,N'-dimethyl)aniline	101-61-1	2.2E-01	ca	9.4E+00	ca	--	--	--	--
Methylene bromide	74-95-3	1.0E+00	nc	1.8E+01	nc	6.5E+01	1.1E+03	3.5E+01	5.8E+02
Methylene chloride	75-09-2	1.0E+02	ca	2.6E+03	nc	1.4E+03	3.5E+04	3.4E+03	8.8E+04
4,4'-Methylenediphenyl isocyanate	101-68-8	1.6E-01	nc	2.6E+00	nc	--	--	--	--
2-(1-Methylethoxy)phenol methylcarbamate (Baygon)	114-26-1	--		--		--	--	--	--
Methyl ethyl ketone (2-Butanone)	78-93-3	1.3E+03	nc	2.2E+04	nc	1.1E+06	1.9E+07	4.3E+04	7.3E+05
Methyl isobutyl ketone (4-Methyl-2-pentanone)	108-10-1	7.8E+02	nc	1.3E+04	nc	3.1E+05	5.3E+06	2.6E+04	4.4E+05
Methyl methacrylate	80-62-6	1.8E+02	nc	3.1E+03	nc	3.3E+04	5.6E+05	6.1E+03	1.0E+05
2-Methyl-5-nitroaniline	99-55-8	--		--		--	--	--	--
Methyl parathion	298-00-0	--		--		--	--	--	--
2-Methylphenol	95-48-7	1.6E+02	nc	2.6E+03	nc	--	--	--	--
3-Methylphenol	108-39-4	1.6E+02	nc	2.6E+03	nc	--	--	--	--
4-Methylphenol	106-44-5	1.6E+02	nc	2.6E+03	nc	--	--	--	--
Methyl phosphonic acid	993-13-5	--		--		--	--	--	--
Methyl styrene (mixture)	25013-15-4	1.0E+01	nc	1.8E+02	nc	3.3E+02	5.6E+03	3.5E+02	5.8E+03
Methyl styrene (alpha)	98-83-9	--		--		--	--	--	--
Methyl tertbutyl ether (MTBE)	1634-04-4	1.1E+01	ca	4.7E+02	ca	8.2E+02	3.6E+04	3.6E+02	1.6E+04
Metolaclor (Dual)	51218-45-2	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 (µg/m^3)		Industrial TCR=1E-05/ THQ=1 (µg/m^3)		Residential TCR=1E-06/ THQ=0.25 (µg/l)	Industrial TCR=1E-05/ THQ=1 (µg/l)	Residential TCR=1E-06/ THQ=0.25 (µg/m^3)	Industrial TCR=1E-05/ THQ=1 (µg/m^3)
Metribuzin	21087-64-9	--		--		--	--	--	--
Metsulfuron-methyl (Ally)	74223-64-6	--		--		--	--	--	--
Mirex	2385-85-5	5.5E-04	ca	2.4E-02	ca	1.7E-02	7.3E-01	1.8E-02	8.0E-01
Molinate	2212-67-1	--		--		--	--	--	--
Molybdenum	7439-98-7	--		--		--	--	--	--
Monochloramine	10599-90-3	--		--		--	--	--	--
Myclobutanil (Systhane)	88671-89-0	--		--		--	--	--	--
Naled	300-76-5	--		--		--	--	--	--
Napropamide	15299-99-7	--		--		--	--	--	--
Nickel and compounds	7440-02-0	1.1E-02	ca	3.9E-01	nc	--	--	--	--
Nickel refinery dust	7440-02-0-NRD	3.7E-03	nc	6.1E-02	nc	--	--	--	--
Nickel subsulfide	12035-72-2	3.7E-03	nc	6.1E-02	nc	--	--	--	--
Nitrate	14797-55-8	--		--		--	--	--	--
Nitrite	14797-65-0	--		--		--	--	--	--
2-Nitroaniline	88-74-4	1.3E-02	nc	2.2E-01	nc	--	--	--	--
Nitrobenzene	98-95-3	7.0E-02	ca	3.1E+00	ca	2.2E+02	9.5E+03	2.3E+00	1.0E+02
Nitrofurantoin	67-20-9	--		--		--	--	--	--
Nitrofurazone	59-87-0	7.6E-03	ca	3.3E-01	ca	--	--	--	--
Nitroglycerin	55-63-0	--		--		--	--	--	--
Nitroguanidine	556-88-7	--		--		--	--	--	--
2-Nitropropane	79-46-9	1.0E-03	ca	4.5E-02	ca	4.9E-01	2.1E+01	3.5E-02	1.5E+00
N-Nitrosodi-n-butylamine	924-16-3	1.8E-03	ca	7.7E-02	ca	3.3E+00	1.4E+02	5.8E-02	2.6E+00
N-Nitrosodiethanolamine	1116-54-7	3.5E-03	ca	1.5E-01	ca	--	--	--	--
N-Nitrosodiethylamine	55-18-5	2.4E-05	ca	2.9E-03	ca	--	--	--	--
N-Nitrosodimethylamine	62-75-9	7.2E-05	ca	8.8E-03	ca	9.7E-01	1.2E+02	2.4E-03	2.9E-01
N-Nitrosodiphenylamine	86-30-6	1.1E+00	ca	4.7E+01	ca	--	--	--	--
N-Nitroso di-n-propylamine	621-64-7	1.4E-03	ca	6.1E-02	ca	--	--	--	--
N-Nitroso-N-methylethylamine	10595-95-6	4.5E-04	ca	1.9E-02	ca	7.6E+00	3.3E+02	1.5E-02	6.5E-01
N-Nitrosopyrrolidine	930-55-2	4.6E-03	ca	2.0E-01	ca	--	--	--	--
m-Nitrotoluene	99-08-1	--		--		--	--	--	--
o-Nitrotoluene	88-72-2	--		--		--	--	--	--
p-Nitrotoluene	99-99-0	--		--		--	--	--	--
Norflurazon	27314-13-2	--		--		--	--	--	--
Octabromodiphenyl ether	32536-52-0	--		--		--	--	--	--
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	--		--		--	--	--	--
Octamethylpyrophosphoramide	152-16-9	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 (µg/m^3)		Industrial TCR=1E-05/ THQ=1 (µg/m^3)		Residential TCR=1E-06/ THQ=0.25 (µg/l)	Industrial TCR=1E-05/ THQ=1 (µg/l)	Residential TCR=1E-06/ THQ=0.25 (µg/m^3)	Industrial TCR=1E-05/ THQ=1 (µg/m^3)
Oryzalin	19044-88-3	--		--		--	--	--	--
Oxadiazon	19666-30-9	--		--		--	--	--	--
Oxamyl	23135-22-0	--		--		--	--	--	--
Oxyfluorfen	42874-03-3	--		--		--	--	--	--
Paclobutrazol	76738-62-0	--		--		--	--	--	--
Paraquat	4685-14-7	--		--		--	--	--	--
Parathion	56-38-2	--		--		--	--	--	--
Pebulate	1114-71-2	--		--		--	--	--	--
Pendimethalin	40487-42-1	--		--		--	--	--	--
Pentabromo-6-chloro cyclohexane	87-84-3	--		--		--	--	--	--
Pentabromodiphenyl ether	32534-81-9	--		--		--	--	--	--
Pentachlorobenzene	608-93-5	--		--		--	--	--	--
Pentachloronitrobenzene	82-68-8	--		--		--	--	--	--
Pentachlorophenol	87-86-5	5.5E-01	ca	2.4E+01	ca	--	--	--	--
Perchlorate	14797-73-0	--		--		--	--	--	--
Perfluoroalkyl Compounds									
Perfluoro-octanesulfonate (PFOS)^^	1763-23-1	--		--		--	--	--	--
Perfluorooctanoic acid (PFOA)^^	335-67-1	--		--		--	--	--	--
Permethrin	52645-53-1	--		--		--	--	--	--
Phenmedipham	13684-63-4	--		--		--	--	--	--
Phenol	108-95-2	5.2E+01	nc	8.8E+02	nc	--	--	--	--
m-Phenylenediamine	108-45-2	--		--		--	--	--	--
p-Phenylenediamine	106-50-3	--		--		--	--	--	--
Phenylmercuric acetate	62-38-4	--		--		--	--	--	--
2-Phenylphenol	90-43-7	--		--		--	--	--	--
Phorate	298-02-2	--		--		--	--	--	--
Phosmet	732-11-6	--		--		--	--	--	--
Phosphine	7803-51-2	7.8E-02	nc	1.3E+00	nc	7.8E-02	1.3E+00	2.6E+00	4.4E+01
Phosphoric acid	7664-38-2	2.6E+00	nc	4.4E+01	nc	--	--	--	--
Phosphorus (white)	7723-14-0	--		--		--	--	--	--
p-Phthalic acid	100-21-0	--		--		--	--	--	--
Phthalic anhydride	85-44-9	5.2E+00	nc	8.8E+01	nc	--	--	--	--
Picloram	1918-02-1	--		--		--	--	--	--
Pirimiphos-methyl	29232-93-7	--		--		--	--	--	--
Polybrominated biphenyls (PBBs)	59536-65-1	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)		Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)		Residential TCR=1E-06/ THQ=0.25 ($\mu g/l$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/l$)	Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)
Polychlorinated biphenyls (PCBs)	1336-36-3	--		--		--	--	--	--
Aroclor 1016	12674-11-2	--		--		--	--	--	--
Aroclor 1221	11104-28-2	--		--		1.6E-01	7.2E+00	1.6E-01	7.2E+00
Aroclor 1232	11141-16-5	4.9E-03	ca	2.2E-01	ca	1.6E-01	NVT	1.6E-01	7.2E+00
Aroclor 1242	53469-21-9	4.9E-03	ca	2.2E-01	ca	3.5E-01	1.5E+01	1.6E-01	7.2E+00
Aroclor 1248	12672-29-6	4.9E-03	ca	2.2E-01	ca	2.7E-01	1.2E+01	1.6E-01	7.2E+00
Aroclor 1254	11097-69-1	4.9E-03	ca	2.2E-01	ca	4.3E-01	1.9E+01	1.6E-01	7.2E+00
Aroclor 1260	11096-82-5	4.9E-03	ca	2.2E-01	ca	3.6E-01	NVT	1.6E-01	7.2E+00
Polynuclear aromatic hydrocarbons (PAHs)									
Acenaphthene	83-32-9	--		--		--	--	--	--
Anthracene	120-12-7	--		--		--	--	--	--
Benz[a]anthracene	56-55-3	1.7E-02	ca	2.0E+00	ca	NVT	NVT	5.6E-01	NVT
Benzo[a]pyrene	50-32-8	5.2E-04	nc	8.8E-03	nc	--	--	--	--
Benzo[b]fluoranthene	205-99-2	1.7E-02	ca	2.0E+00	ca	NVT	NVT	--	NVT
Benzo[k]fluoranthene	207-08-9	1.7E-01	ca	2.0E+01	ca	--	--	--	--
Chrysene	218-01-9	1.7E+00	ca	2.0E+02	ca	--	--	--	--
Dibenz[ah]anthracene	53-70-3	1.7E-03	ca	2.0E-01	ca	--	--	--	--
Fluoranthene	206-44-0	--		--		--	--	--	--
Fluorene	86-73-7	--		--		--	--	--	--
Indeno[1,2,3-cd]pyrene	193-39-5	1.7E-02	ca	2.0E+00	ca	--	--	--	--
Naphthalene	91-20-3	8.3E-02	ca	3.6E+00	ca	1.3E+01	5.9E+02	2.8E+00	1.2E+02
Pyrene	129-00-0	--		--		--	--	--	--
Prochloraz	67747-09-5	--		--		--	--	--	--
Profluralin	26399-36-0	--		--		--	--	--	--
Prometon	1610-18-0	--		--		--	--	--	--
Prometryn	7287-19-6	--		--		--	--	--	--
Propyzamide (Pronamide)	23950-58-5	--		--		--	--	--	--
Propachlor	1918-16-7	--		--		--	--	--	--
Propanil	709-98-8	--		--		--	--	--	--
Propargite	2312-35-8	--		--		--	--	--	--
Propargyl alcohol	107-19-7	--		--		--	--	--	--
Propazine	139-40-2	--		--		--	--	--	--
Propham	122-42-9	--		--		--	--	--	--
Propiconazole	60207-90-1	--		--		--	--	--	--
n-Propylbenzene	103-65-1	2.6E+02	nc	4.4E+03	nc	1.6E+03	2.6E+04	8.7E+03	1.5E+05
Propylene glycol	57-55-6	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)		Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)		Residential TCR=1E-06/ THQ=0.25 ($\mu g/l$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/l$)	Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)
Propylene glycol, monoethyl ether	52125-53-8	5.2E+02	nc	8.8E+03	nc	3.0E+07	5.0E+08	1.7E+04	2.9E+05
Propylene glycol, monomethyl ether	107-98-2	5.2E+02	nc	8.8E+03	nc	3.0E+07	5.0E+08	1.7E+04	2.9E+05
Propylene oxide	75-56-9	7.6E-01	ca	3.3E+01	ca	3.0E+07	5.0E+08	1.7E+04	2.9E+05
Pyridine	110-86-1	--		--		--	--	--	--
Quinalphos	13593-03-8	--		--		--	--	--	--
Quinoline	91-22-5	--		--		--	--	--	--
Resmethrin	10453-86-8	--		--		--	--	--	--
Ronnel	299-84-3	--		--		--	--	--	--
Rotenone	83-79-4	--		--		--	--	--	--
Selenious Acid	7783-00-8	--		--		--	--	--	--
Selenium	7782-49-2	5.2E+00	nc	8.8E+01	nc	--	--	--	--
Sethoxydim	74051-80-2	--		--		--	--	--	--
Silver and compounds	7440-22-4	--		--		--	--	--	--
Simazine	122-34-9	--		--		--	--	--	--
Sodium azide	26628-22-8	--		--		--	--	--	--
Sodium diethyldithiocarbamate	148-18-5	--		--		--	--	--	--
Sodium fluoroacetate	62-74-8	--		--		--	--	--	--
Sodium metavanadate	13718-26-8	--		--		--	--	--	--
Strontium, stable	7440-24-6	--		--		--	--	--	--
Strychnine	57-24-9	--		--		--	--	--	--
Styrene	100-42-5	2.6E+02	nc	4.4E+03	nc	5.5E+03	9.3E+04	8.7E+03	1.5E+05
1,1'-Sulfonylbis (4-Chlorobenzene)	80-07-9	--		--		--	--	--	--
Tebuthiuron	34014-18-1	--		--		--	--	--	--
Temephos	3383-96-8	--		--		--	--	--	--
Terbacil	5902-51-2	--		--		--	--	--	--
Terbufos	13071-79-9	--		--		--	--	--	--
Terbutryn	886-50-0	--		--		--	--	--	--
1,2,4,5-Tetrachlorobenzene	95-94-3	--		--		--	--	--	--
2,3,7,8-Tetrachlorodibenzo-p-dioxin (Dioxin)	1746-01-6	7.4E-08	ca	3.2E-06	ca	3.6E-05	1.6E-03	2.5E-06	1.1E-04
1,1,1,2-Tetrachloroethane	630-20-6	3.8E-01	ca	1.7E+01	ca	9.6E+00	4.2E+02	1.3E+01	5.5E+02
1,1,2,2-Tetrachloroethane	79-34-5	4.8E-02	ca	2.1E+00	ca	7.8E+00	3.4E+02	1.6E+00	7.0E+01
Tetrachloroethylene (PCE)	127-18-4	1.0E+01	nc	1.8E+02	nc	3.2E+01	5.4E+02	3.5E+02	5.8E+03
2,3,4,6-Tetrachlorophenol	58-90-2	--		--		--	--	--	--
p,a,a,a-Tetrachlorotoluene	5216-25-1	--		--		--	--	--	--
Tetrachlorovinphos (Stirofos)	961-11-5	--		--		--	--	--	--
Tetraethyldithiopyrophosphate	3689-24-5	--		--		--	--	--	--

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)		Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)		Residential TCR=1E-06/ THQ=0.25 ($\mu g/l$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/l$)	Residential TCR=1E-06/ THQ=0.25 ($\mu g/m^3$)	Industrial TCR=1E-05/ THQ=1 ($\mu g/m^3$)
Thallium and compounds	7440-28-0	--		--		--	--	--	--
Thiobencarb	28249-77-6	--		--		--	--	--	--
Thiofanox	39196-18-4	--		--		--	--	--	--
Thiophanate-methyl	23564-05-8	--		--		--	--	--	--
Thiram	137-26-8	--		--		--	--	--	--
Tin and compounds	7440-31-5	--		--		--	--	--	--
Toluene	108-88-3	1.3E+03	nc	2.2E+04	nc	1.0E+04	1.7E+05	4.3E+04	7.3E+05
p-Toluidine	106-49-0	--		--		--	--	--	--
Tralomethrin	66841-25-6	--		--		--	--	--	--
Triadimefon (Bayleton)	43121-43-3	--		--		--	--	--	--
Triallate	2303-17-5	--		--		--	--	--	--
Triasulfuron	82097-50-5	--		--		--	--	--	--
Tribenuron-methyl (Express)	101200-48-0	--		--		--	--	--	--
1,2,4-Tribromobenzene	615-54-3	--		--		--	--	--	--
Tributyltin oxide (TBTO)	56-35-9	--		--		--	--	--	--
2,4,6-Trichloroaniline	634-93-5	--		--		--	--	--	--
2,4,6-Trichloroaniline hydrochloride	33663-50-2	--		--		--	--	--	--
1,2,4-Trichlorobenzene	120-82-1	5.2E-01	nc	8.8E+00	nc	2.7E+01	4.5E+02	1.7E+01	2.9E+02
1,1,1-Trichloroethane	71-55-6	1.3E+03	nc	2.2E+04	nc	3.6E+03	6.0E+04	4.3E+04	7.3E+05
1,1,2-Trichloroethane	79-00-5	5.2E-02	nc	8.8E-01	nc	3.4E+00	5.8E+01	1.7E+00	2.9E+01
Trichloroethylene (TCE) Long-term +++	79-01-6	4.8E-01	ca	8.8E+00	nc	2.4E+00	4.4E+01	1.6E+01	2.9E+02
Trichloroethylene (TCE) Short-term ‡	79-01-6	2.0E+00	nc	6.0E+00	nc	1.0E+01	3.0E+01	6.7E+01	2.0E+02
Trichlorofluoromethane	75-69-4	--		--		--	--	--	--
2,4,5-Trichlorophenol	95-95-4	--		--		--	--	--	--
2,4,6-Trichlorophenol	88-06-2	2.0E+00	nc	6.0E+00	ca				
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	--		--		--	--	--	--
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	93-72-1	--		--		--	--	--	--
1,1,2-Trichloropropane	598-77-6	--		--		--	--	--	--
1,2,3-Trichloropropane	96-18-4	7.8E-02	nc	1.3E+00	nc	1.4E+01	2.4E+02	2.6E+00	4.4E+01
1,2,3-Trichloropropene	96-19-5	7.8E-02	nc	1.3E+00	nc	1.1E-01	1.8E+00	2.6E+00	4.4E+01
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	1.3E+03	nc	2.2E+04	nc	1.1E+02	1.8E+03	4.3E+04	7.3E+05
Tridiphane	58138-08-2	--		--		--	--	--	--
Triethylamine	121-44-8	1.8E+00	nc	3.1E+01	nc	6.5E+02	1.1E+04	6.1E+01	1.0E+03
Trifluralin	1582-09-8	--		--		--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	1.6E+01	nc	2.6E+02	nc	1.6E+02	2.8E+03	5.2E+02	8.8E+03
1,3,5-Trimethylbenzene	108-67-8	1.6E+01	nc	2.6E+02	nc	--	--	--	--
Trimethyl phosphate	512-56-1	--		--		--	--	--	--

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE A-2: INDOOR AIR, SOIL GAS, and GROUNDWATER VAPOR INTRUSION REMEDIATION GOALS

CONTAMINANT	CAS No.	Indoor Air				Vapor Intrusion Inhalation Pathway			
						Groundwater		Subslab and Exterior Soil Gas	
		Residential TCR=1E-06/ THQ=0.25 (µg/m^3)		Industrial TCR=1E-05/ THQ=1 (µg/m^3)		Residential TCR=1E-06/ THQ=0.25 (µg/l)	Industrial TCR=1E-05/ THQ=1 (µg/l)	Residential TCR=1E-06/ THQ=0.25 (µg/m^3)	Industrial TCR=1E-05/ THQ=1 (µg/m^3)
1,3,5-Trinitrobenzene	99-35-4	--		--		--	--	--	--
Trinitrophenylmethylnitramine (Tetryl)	479-45-8	--		--		--	--	--	--
2,4,6-Trinitrotoluene (TNT)	118-96-7	--		--		--	--	--	--
Triphenylphosphine oxide	791-28-6	--		--		--	--	--	--
Tris(2-chloroethyl) phosphate	115-96-8	--		--		--	--	--	--
Uranium (chemical toxicity only)	7440-61-0	1.0E-02	nc	1.8E-01	nc	--	--	--	--
Vanadium and compounds +++	7440-62-2	2.6E-02	nc	4.4E-01	nc	--	--	--	--
Vernolate (Vernam)	1929-77-7	--		--		--	--	--	--
Vinclozolin	50471-44-8	--		--		--	--	--	--
Vinyl acetate	108-05-4	5.2E+01	nc	8.8E+02	nc	5.2E+03	8.7E+04	1.7E+03	2.9E+04
Vinyl bromide	593-60-2	8.8E-02	ca	3.8E+00	ca	2.7E-01	1.2E+01	2.9E+00	1.3E+02
Vinyl chloride +++	75-01-4	1.7E-01	ca	2.8E+01	ca	2.2E-01	3.7E+01	5.6E+00	9.3E+02
Warfarin	81-81-2	--		--		--	--	--	--
Xylenes	1330-20-7	2.6E+01	nc	4.4E+02	nc	2.3E+02	3.8E+03	8.7E+02	1.5E+04
Zinc	7440-66-6	--		--		No VP	No VP	No VP	No VP
Zinc phosphide	1314-84-7	--		--		No VP	No VP	No VP	No VP
Zineb	12122-67-7	--		--		--	--	--	--

Notes:

* At VCP sites where chromium is a potential contaminant of concern, such as a former metal plating facility, the VCP applicant should collect media samples for both Chromium III and Chromium VI analyses.

‡ Short-term exposures to TCE during pregnancy are associated with many forms of developmental toxicity, with the critical develpoment endpoint being cardiac malformations. The type and severity of the resulting cardiac malformation depends on the timing and level of exposure to TCE approximately four to seven weeks after conception. Therefore, the EPA standard default exposure parameters for chronic exposures are invalid for estimating hazard quotients for potential cardiac defects and deriving screening levels protective of developmental endpoints. The EPA Region 7 Action Levels for TCE in air were used for short-term indoor air exposure to TCE and these values were used to calculcate the concentrations via the vapor intrusion pathway.

+++ See Section 5.4 of Appendix A, Protocol for VCP Remediation Goal Lookup Tables, Nebraska Voluntary Cleanup Program for more information.

-- = Not available/not applicable
µg/L = Micrograms per liter
µg/m^3 = Micrograms per cubic meter
ca = cancer
CAS No. = Chemical Abstract Service Number
nc = noncancer
NVT = Not sufficiently volatile or toxic (in selected exposure scenario)

ATTACHMENT B

SUPPORTING TABLES FOR CALCULATING THE VCP REMEDIATION GOALS

Table B-1: Toxicity Values

Table B-2: Chemical-Specific Parameters

Table B-3: Groundwater Remediation Goals

Table B-4: Soil Remediation Goals

Table B-5: Subslab and Exterior Soil Gas and Groundwater to Indoor Remediation Goals

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Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-1: TOXICITY VALUES

Version Date: September 2018

Source of toxicity values: EPA RSLs May 2018, except as noted

Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
Acephate	30560-19-1			1.2E-03	O				
Acetaldehyde	75-07-0					2.2E-06	I	9.0E-03	I
Acetochlor	34256-82-1			2.0E-02	I				
Acetone	67-64-1			9.0E-01	I			3.1E+01	A
Acetone cyanohydrin	75-86-5							2.0E-03	X
Acetonitrile	75-05-8							6.0E-02	I
Acrolein	107-02-8			5.0E-04	I			2.0E-05	I
Acrylamide	79-06-1	5.0E-01	I	2.0E-03	I	1.0E-04	I	6.0E-03	I
Acrylic acid	79-10-7			5.0E-01	I			1.0E-03	I
Acrylonitrile	107-13-1	5.4E-01	I	4.0E-02	A	6.8E-05	I	2.0E-03	I
Alachlor	15972-60-8	5.6E-02	C	1.0E-02	I				
Aldicarb	116-06-3			1.0E-03	I				
Aldicarb sulfone	1646-88-4			1.0E-03	I				
Aldrin	309-00-2	1.7E+01	I	3.0E-05	I	4.9E-03	I		
Allyl alcohol	107-18-6			5.0E-03	I			1.0E-04	X
Allyl chloride	107-05-1	2.1E-02	C			6.0E-06	C	1.0E-03	I
Aluminum	7429-90-5			1.0E+00	P			5.0E-03	P
Aluminum phosphide	20859-73-8			4.0E-04	I				
Ametryn	834-12-8			9.0E-03	I				
m-Aminophenol	591-27-5			8.0E-02	P				
Amitraz	33089-61-1			2.5E-03	I				
Ammonia +++	7664-41-7							5.0E-01	I
Ammonium sulfamate	7773-06-0			2.0E-01	I				
Aniline	62-53-3	5.7E-03	I	7.0E-03	P	1.6E-06	C	1.0E-03	I
Antimony and compounds	7440-36-0			4.0E-04	I				
Antimony pentoxide	1314-60-9			5.0E-04	H				
Antimony potassium tartrate [1]	28300-74-5			9.0E-04	H				
Antimony tetroxide	1332-81-6			4.0E-04	H				
Antimony trioxide	1309-64-4							2.0E-04	I
Arsenic (inorganic) +++	7440-38-2	1.5E+00	I	3.0E-04	I	4.3E-03	I	1.5E-05	C
Arsine	7784-42-1			3.5E-06	C			5.0E-05	I
Assure	76578-14-8			9.0E-03	I				

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-1: TOXICITY VALUES

Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
Asulam	3337-71-1			3.6E-02	O				
Atrazine	1912-24-9	2.3E-01	C	3.5E-02	I				
Avermectin B1	65195-55-3			4.0E-04	I				
Azobenzene	103-33-3	1.1E-01	I			3.1E-05	I		
Barium and compounds	7440-39-3			2.0E-01	I			5.0E-04	H
Benfluralin (Benefin)	1861-40-1			5.0E-03	O				
Bensulfuron-methyl (Londax)	83055-99-6			2.0E-01	I				
Bentazone (Bentazon)	25057-89-0			3.0E-02	I				
Benzaldehyde	100-52-7	4.0E-03	P	1.0E-01	I				
Benzene	71-43-2	5.5E-02	I	4.0E-03	I	7.8E-06	I	3.0E-02	I
Benzidine	92-87-5	2.3E+02	I	3.0E-03	I	6.7E-02	I		
Benzoic acid	65-85-0			4.0E+00	I				
Benzotrichloride	98-07-7	1.3E+01	I						
Benzyl alcohol	100-51-6			1.0E-01	P				
Benzyl chloride	100-44-7	1.7E-01	I	2.0E-03	P	4.9E-05	C	1.0E-03	P
Beryllium and compounds	7440-41-7			2.0E-03	I	2.4E-03	I	2.0E-05	I
Biphenthrin (Talstar)	82657-04-3			1.5E-02	I				
1,1-Biphenyl	92-52-4	8.0E-03	I	5.0E-01	I			4.0E-04	X
Bis(2-chloroethyl)ether	111-44-4	1.1E+00	I			3.3E-04	I		
Bis(chloromethyl)ether	542-88-1	2.2E+02	I			6.2E-02	I		
Bis(2-chloro-1-methylethyl)ether	108-60-1			4.0E-02	I				
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	1.4E-02	I	2.0E-02	I	2.4E-06	C		
Bisphenol A	80-05-7			5.0E-02	I				
Boron	7440-42-8			2.0E-01	I			2.0E-02	H
Boron trifluoride	7637-07-2			4.0E-02	C			1.3E-02	C
Bromate	15541-45-4	7.0E-01	I	4.0E-03	I				
Bromobenzene	108-86-1			8.0E-03	I			6.0E-02	I
Bromodichloromethane	75-27-4	6.2E-02	I	2.0E-02	I	3.7E-05	C		
Bromoform (Tribromomethane)	75-25-2	7.9E-03	I	2.0E-02	I	1.1E-06	I		
Bromomethane	74-83-9			1.4E-03	I			5.0E-03	I
Bromophos	2104-96-3			5.0E-03	H				
Bromoxynil	1689-84-5	1.0E-01	O	1.5E-02	O				
Bromoxynil octanoate	1689-99-2	1.0E-01	O	1.5E-02	O				
1,3-Butadiene	106-99-0	3.4E+00	C			3.0E-05	I	2.0E-03	I

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-1: TOXICITY VALUES

Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
1-Butanol	71-36-3			1.0E-01	I				
Butylate	2008-41-5			5.0E-02	I				
Butyl benzyl phthalate	85-68-7	1.9E-03	P	2.0E-01	I				
Butylphthalyl butylglycolate	85-70-1			1.0E+00	I				
Cacodylic acid	75-60-5			2.0E-02	A				
Cadmium and compounds +++	7440-43-9			1.0E-03	I	1.8E-03	I	1.0E-05	A
Camphechlor (Toxaphene)	8001-35-2	1.1E+00	I			3.2E-04	I		
Caprolactam	105-60-2			5.0E-01	I			2.2E-03	C
Captafol	2425-06-1	1.5E-01	C	2.0E-03	I	4.3E-05	C		
Captan	133-06-2	2.3E-03	C	1.3E-01	I	6.6E-07	C		
Carbaryl	63-25-2			1.0E-01	I				
Carbofuran	1563-66-2			5.0E-03	I				
Carbon disulfide	75-15-0			1.0E-01	I			7.0E-01	I
Carbon tetrachloride	56-23-5	7.0E-02	I	4.0E-03	I	6.0E-06	I	1.0E-01	I
Carbosulfan	55285-14-8			1.0E-02	I				
Carboxin	5234-68-4			1.0E-01	I				
Chloramben	133-90-4			1.5E-02	I				
Chloranil	118-75-2	4.0E-01	H						
Chlordane	12789-03-6	3.5E-01	I	5.0E-04	I	1.0E-04	I	7.0E-04	I
Chlordecone (Kepone)	143-50-0	1.0E+01	I	3.0E-04	I	4.6E-03	C		
Chlorimuron-ethyl	90982-32-4			9.0E-02	O				
Chlorine	7782-50-5			1.0E-01	I			1.5E-04	A
Chlorine dioxide	10049-04-4			3.0E-02	I			2.0E-04	I
Chloroacetic acid	79-11-8								
2-Chloroacetophenone	532-27-4							3.0E-05	I
4-Chloroaniline	106-47-8	2.0E-01	P	4.0E-03	I				
Chlorobenzene	108-90-7			2.0E-02	I			5.0E-02	P
Chlorobenzilate	510-15-6	1.1E-01	C	2.0E-02	I	3.1E-05	C		
p-Chlorobenzoic acid	74-11-3			3.0E-02	X				
4-Chlorobenzotrifluoride	98-56-6			3.0E-03	P			3.0E-01	P
2-Chloro-1,3-butadiene	126-99-8			2.0E-02	H	3.0E-04	I	2.0E-02	I
1-Chlorobutane	109-69-3			4.0E-02	P				
1-Chloro-1,1-difluoroethane	75-68-3							5.0E+01	I
Chlorodifluoromethane	75-45-6							5.0E+01	I

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-1: TOXICITY VALUES

Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
2-Chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester sulfurous acid (Aramite)	140-57-8	2.5E-02	I	5.0E-02	H	7.1E-06	I		
Chloroform	67-66-3	3.1E-02	C	1.0E-02	I	2.3E-05	I	9.8E-02	A
Chloromethane	74-87-3							9.0E-02	I
4-Chloro-2-methylaniline hydrochloride	3165-93-3	4.6E-01	H						
beta-Chloronaphthalene	91-58-7			8.0E-02	I				
o-Chloronitrobenzene	88-73-3	3.0E-01	P	3.0E-03	P			1.0E-05	X
p-Chloronitrobenzene	100-00-5	6.0E-02	P	7.0E-04	P			2.0E-03	P
2-Chlorophenol	95-57-8			5.0E-03	I				
Chlorothalonil	1897-45-6	3.1E-03	C	1.5E-02	I	8.9E-07	C		
o-Chlorotoluene	95-49-8			2.0E-02	I				
Chlorpropham	101-21-3			5.0E-02	O				
Chlorpyrifos	2921-88-2			1.0E-03	A				
Chlorpyrifos-methyl	5598-13-0			1.0E-02	H				
Chlorsulfuron	64902-72-3			5.0E-02	O				
Chlorthiophos	60238-56-4			8.0E-04	H				
Chromium, Total	7440-47-3								
Chromium III *	16065-83-1			1.5E+00	I				
Chromium VI +++	18540-29-9	5.0E-01	C	3.0E-03	I	8.4E-02	S	1.0E-04	I
Clofentezine (Apollo)	74115-24-5			1.3E-02	I				
Cobalt	7440-48-4			3.0E-04	P	9.0E-03	P	6.0E-06	P
Coke Oven Emissions	8007-45-2					6.2E-04	I		
Copper and compounds	7440-50-8			4.0E-02	H				
Crotonaldehyde	123-73-9	1.9E+00	H	1.0E-03	P				
Cumene (Isopropylbenzene)	98-82-8			1.0E-01	I			4.0E-01	I
Cyanazine	21725-46-2	8.4E-01	H	2.0E-03	H				
Cyanide (free)	57-12-5			6.0E-04	I			8.0E-04	S
Cyanide (hydrogen)	74-90-8			6.0E-04	I			8.0E-04	I
Cyanogen	460-19-5			1.0E-03	I				
Cyanogen bromide	506-68-3			9.0E-02	I				
Cyanogen chloride	506-77-4			5.0E-02	I				
Cyclohexane	110-82-7							6.0E+00	I
Cyclohexanone	108-94-1			5.0E+00	I			7.0E-01	P
Cyclohexylamine	108-91-8			2.0E-01	I				
Cyfluthrin (Baythroid)	68359-37-5			2.5E-02	I				

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Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
Cyhalothrin (Karate)	68085-85-8			1.0E-03	O				
Cyromazine	66215-27-8			5.0E-01	O				
Dacthal	1861-32-1			1.0E-02	I				
Dalapon	75-99-0			3.0E-02	I				
Daminozide (Alar)	1596-84-5	1.8E-02	C	1.5E-01	I	5.1E-06	C		
Demeton	8065-48-3			4.0E-05	I				
Diallate	2303-16-4	6.1E-02	H						
Diazinon	333-41-5			7.0E-04	A				
Dibenzofuran	132-64-9			1.0E-03	X				
1,4-Dibromobenzene	106-37-6			1.0E-02	I				
Dibromochloromethane	124-48-1	8.4E-02	I	2.0E-02	I				
1,2-Dibromo-3-chloropropane	96-12-8	8.0E-01	P	2.0E-04	P	6.0E-03	P	2.0E-04	I
1,2-Dibromoethane	106-93-4	2.0E+00	I	9.0E-03	I	6.0E-04	I	9.0E-03	I
Dibutyl phthalate	84-74-2			1.0E-01	I				
Dicamba	1918-00-9			3.0E-02	I				
1,2-Dichlorobenzene	95-50-1			9.0E-02	I			2.0E-01	H
1,4-Dichlorobenzene	106-46-7	5.4E-03	C	7.0E-02	A	1.1E-05	C	8.0E-01	I
3,3-Dichlorobenzidine	91-94-1	4.5E-01	I			3.4E-04	C		
4,4'-Dichlorobenzophenone	90-98-2			9.0E-03	X				
1,4-Dichloro-2-butene	764-41-0					4.2E-03	P		
Dichlorodifluoromethane	75-71-8			2.0E-01	I			1.0E-01	X
p,p'-Dichlorodiphenyldichloroethane (DDD)	72-54-8	2.4E-01	I	3.0E-05	X	6.9E-05	C		
p,p'-Dichlorodiphenyldichloroethylene (DDE)	72-55-9	3.4E-01	I	3.0E-04	X	9.7E-05	C		
p,p'-Dichlorodiphenyltrichloroethane (DDT)	50-29-3	3.4E-01	I	5.0E-04	I	9.7E-05	I		
1,1-Dichloroethane	75-34-3	5.7E-03	C	2.0E-01	P	1.6E-06	C		
1,2-Dichloroethane	107-06-2	9.1E-02	I	6.0E-03	X	2.6E-05	I	7.0E-03	P
1,1-Dichloroethylene	75-35-4			5.0E-02	I			2.0E-01	I
1,2-Dichloroethylene (cis)	156-59-2			2.0E-03	I				
1,2-Dichloroethylene (trans)	156-60-5			2.0E-02	I				
2,4-Dichlorophenol	120-83-2			3.0E-03	I				
2,4-Dichlorophenoxy acetic acid (2,4-D)	94-75-7			1.0E-02	I				
2,4-Dichlorophenoxy butyric acid (2,4-DB)	94-82-6			3.0E-02	O				
Decabromodiphenyl ether (BDE-209)	1163-19-5	7.0E-04	I	7.0E-03	I				
1,2-Dichloropropane	78-87-5	3.7E-02	P	4.0E-02	P	3.7E-06	P	4.0E-03	I

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TABLE B-1: TOXICITY VALUES

Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
2,3-Dichloropropanol	616-23-9			3.0E-03	I				
1,3-Dichloropropene	542-75-6	1.0E-01	I	3.0E-02	I	4.0E-06	I	2.0E-02	I
Dichlorvos	62-73-7	2.9E-01	I	5.0E-04	I	8.3E-05	C	5.0E-04	I
Dicrotophos (Bidrin)	141-66-2			3.0E-05	O				
Dicyclopentadiene	77-73-6			8.0E-02	P			3.0E-04	X
Dieldrin	60-57-1	1.6E+01	I	5.0E-05	I	4.6E-03	I		
Diethylene glycol, monobutyl ether	112-34-5			3.0E-02	P			1.0E-04	P
Diethylene glycol, monoethyl ether	111-90-0			6.0E-02	P			3.0E-04	P
Diethylformamide	617-84-5			1.0E-03	P				
Di(2-ethylhexyl)adipate	103-23-1	1.2E-03	I	6.0E-01	I				
Diethyl phthalate	84-66-2			8.0E-01	I				
Diethylstilbestrol	56-53-1	3.5E+02	C			1.0E-01	C		
Difenzoquat (Avenge)	43222-48-6			8.3E-02	O				
Diflubenzuron	35367-38-5			2.0E-02	I				
1,1-Difluoroethane	75-37-6							4.0E+01	I
Diisopropyl methylphosphonate (DIMP)	1445-75-6			8.0E-02	I				
Dimethipin	55290-64-7			2.2E-02	O				
Dimethoate	60-51-5			2.2E-03	O				
3,3'-Dimethoxybenzidine	119-90-4	1.6E+00	P						
N-N-Dimethylaniline	121-69-7	2.7E-02	P	2.0E-03	I				
2,4-Dimethylaniline	95-68-1	2.0E-01	P	2.0E-03	X				
2,4-Dimethylaniline hydrochloride	21436-96-4	5.8E-01	H						
3,3'-Dimethylbenzidine	119-93-7	1.1E+01	P						
N,N-Dimethylformamide	68-12-2			1.0E-01	P			3.0E-02	I
2,4-Dimethylphenol	105-67-9			2.0E-02	I				
2,6-Dimethylphenol	576-26-1			6.0E-04	I				
3,4-Dimethylphenol	95-65-8			1.0E-03	I				
Dimethyl terephthalate	120-61-6			1.0E-01	I				
4,6-Dinitro-o-cyclohexyl phenol	131-89-5			2.0E-03	I				
1,2-Dinitrobenzene	528-29-0			1.0E-04	P				
1,3-Dinitrobenzene	99-65-0			1.0E-04	I				
1,4-Dinitrobenzene	100-25-4			1.0E-04	P				
2,4-Dinitrophenol	51-28-5			2.0E-03	I				
Dinitrotoluene mixture	25321-14-6	4.5E-01	X	9.0E-04	X				

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		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
2,4-Dinitrotoluene	121-14-2	3.1E-01	C	2.0E-03	I	8.9E-05	C		
2,6-Dinitrotoluene	606-20-2	1.5E+00	P	3.0E-04	X				
Dinoseb	88-85-7			1.0E-03	I				
1,4-Dioxane	123-91-1	1.0E-01	I	3.0E-02	I	5.0E-06	I	3.0E-02	I
Diphenamid	957-51-7			3.0E-02	I				
Diphenylamine	122-39-4			1.0E-01	O				
N,N-Diphenyl-1,4 benzenediamine (DPPD)	74-31-7			3.0E-04	X				
1,2-Diphenylhydrazine	122-66-7	8.0E-01	I			2.2E-04	I		
Diphenyl sulfone	127-63-9			8.0E-04	X				
Diquat dibromide (Diquat)	85-00-7			2.2E-03	I				
Direct black 38	1937-37-7	7.1E+00	C			1.4E-01	C		
Direct blue 6	2602-46-2	7.4E+00	C			1.4E-01	C		
Direct brown 95	16071-86-6	6.7E+00	C			1.4E-01	C		
Disulfoton	298-04-4			4.0E-05	I				
1,4-Dithiane	505-29-3			1.0E-02	I				
Diuron	330-54-1			2.0E-03	I				
Dodine	2439-10-3			2.0E-02	O				
Endosulfan	115-29-7			6.0E-03	I				
Endothall	145-73-3			2.0E-02	I				
Endrin	72-20-8			3.0E-04	I				
Enilconazole (Imazalil)	35554-44-0	6.1E-02	O	2.5E-03	O				
Epichlorohydrin	106-89-8	9.9E-03	I	6.0E-03	P	1.2E-06	I	1.0E-03	I
1,2-Epoxybutane	106-88-7							2.0E-02	I
S-Ethyl dipropylthiocarbamate (EPTC)	759-94-4			5.0E-02	O				
2-Chloroethyl phosphonic acid (Ethephon)	16672-87-0			5.0E-03	I				
Ethion	563-12-2			5.0E-04	I				
2-Ethoxyethanol	110-80-5			9.0E-02	P			2.0E-01	I
2-Ethoxyethanol acetate	111-15-9			1.0E-01	P			6.0E-02	P
Ethyl acetate	141-78-6			9.0E-01	I			7.0E-02	P
Ethyl acrylate	140-88-5			5.0E-03	P			8.0E-03	P
Ethylbenzene	100-41-4	1.1E-02	C	1.0E-01	I	2.5E-06	C	1.0E+00	I
Ethyl chloride (Chloroethane)	75-00-3							1.0E+01	I
Ethylene cyanohydrin	109-78-4			7.0E-02	P				
Ethylene diamine	107-15-3			9.0E-02	P				

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TABLE B-1: TOXICITY VALUES

Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
Ethylene glycol	107-21-1			2.0E+00	I			4.0E-01	C
Ethylene glycol, monobutyl ether	111-76-2			1.0E-01	I			1.6E+00	I
Ethylene oxide	75-21-8	3.1E-01	C			3.0E-03	I	3.0E-02	C
Ethylene thiourea (ETU)	96-45-7	4.5E-02	C	8.0E-05	I	1.3E-05	C		
Ethyl ether	60-29-7			2.0E-01	I				
Ethyl methacrylate	97-63-2							3.0E-01	P
Ethyl p-nitrophenyl phenylphosphorothioate (EPN)	2104-64-5			1.0E-05	I				
Ethylphthalyl ethyl glycolate	84-72-0			3.0E+00	I				
Fenamiphos	22224-92-6			2.5E-04	I				
Fenpropathrin (Danitol)	39515-41-8			2.5E-02	I				
Fenvalerate (Pydrin)	51630-58-1			2.5E-02	I				
Fluometuron	2164-17-2			1.3E-02	I				
Fluoride	16984-48-8			4.0E-02	C			1.3E-02	C
Fluoridone	59756-60-4			8.0E-02	I				
Flurprimidol	56425-91-3			4.0E-02	O				
Flusilazole (NuStar)	85509-19-9			2.0E-03	O				
Flutolanil	66332-96-5			5.0E-01	O				
Fluvalinate	69409-94-5			1.0E-02	I				
Folpet	133-07-3			9.0E-02	O				
Fomesafen	72178-02-0			2.5E-03	O				
Fonofos	944-22-9			2.0E-03	I				
Formaldehyde	50-00-0			2.0E-01	I	1.3E-05	I	9.8E-03	A
Formic acid	64-18-6			9.0E-01	P			3.0E-04	X
Fosetyl-al	39148-24-8			2.5E+00	O				
Furan	110-00-9			1.0E-03	I				
Furazolidone	67-45-8	3.8E+00	H						
Furfural	98-01-1			3.0E-03	I			5.0E-02	H
Furmecyclox	60568-05-0	3.0E-02	I			8.6E-06	C		
Furothiazole (Furium)	531-82-8	1.5E+00	C			4.3E-04	C		
Glufosinate-ammonium	77182-82-2			6.0E-03	O				
Glycidaldehyde	765-34-4			4.0E-04	I			1.0E-03	H
Glyphosate	1071-83-6			1.0E-01	I				
Haloxyfop-methyl	69806-40-2			5.0E-05	I				
Thifensulfuron-methyl (Harmony)	79277-27-3			4.3E-02	O				

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Heptachlor	76-44-8	4.5E+00	I	5.0E-04	I	1.3E-03	I		
Heptachlor epoxide	1024-57-3	9.1E+00	I	1.3E-05	I	2.6E-03	I		
Hexabromobenzene	87-82-1			2.0E-03	I				
Hexachlorobenzene	118-74-1	1.6E+00	I	8.0E-04	I	4.6E-04	I		
Hexachlorobutadiene	87-68-3	7.8E-02	I	1.0E-03	P	2.2E-05	I		
alpha-Hexachlorocyclohexane (alpha-HCH)	319-84-6	6.3E+00	I	8.0E-03	A	1.8E-03	I		
beta-Hexachlorocyclohexane (beta-HCH)	319-85-7	1.8E+00	I			5.3E-04	I		
gamma-Hexachlorocyclohexane (Lindane)	58-89-9	1.1E+00	C	3.0E-04	I	3.1E-04	C		
Hexachlorocyclohexane technical	608-73-1	1.8E+00	I			5.1E-04	I		
Hexachlorocyclopentadiene	77-47-4			6.0E-03	I			2.0E-04	I
Hexachloroethane	67-72-1	4.0E-02	I	7.0E-04	I	1.1E-05	C	3.0E-02	I
Hexachlorophene	70-30-4			3.0E-04	I				
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX/Cyclonite)	121-82-4	1.1E-01	I	3.0E-03	I				
1,6-Hexamethylene diisocyanate	822-06-0							1.0E-05	I
n-Hexane	110-54-3							7.0E-01	I
Hexazinone	51235-04-2			3.3E-02	I				
Hexythiazox (Savey)	78587-05-0			2.5E-02	I				
Hydramethylnon (Amdro)	67485-29-4			1.7E-02	O				
Hydrazine, hydrazine sulfate	302-01-2	3.0E+00	I			4.9E-03	I	3.0E-05	P
Hydrazine, dimethyl	57-14-7			1.0E-04	X			2.0E-06	X
Hydrogen chloride	7647-01-0							2.0E-02	I
Hydrogen sulfide	7783-06-4							2.0E-03	I
p-Hydroquinone	123-31-9	6.0E-02	P	4.0E-02	P				
Imazaquin	81335-37-7			2.5E-01	I				
Imazethapyr (Pursuit)	81335-77-5			2.5E+00	O				
Iprodione	36734-19-7			4.0E-02	I				
Iron	7439-89-6			7.0E-01	P				
Isobutanol (Isobutyl alcohol)	78-83-1			3.0E-01	I				
Isophorone	78-59-1	9.5E-04	I	2.0E-01	I			2.0E+00	C
Isopropalin	33820-53-0			1.5E-02	I				
Isopropyl methyl phosphonic acid	1832-54-8			1.0E-01	I				
Isoxaben	82558-50-7			5.0E-02	I				
Lactofen	77501-63-4			8.0E-03	O				
Lead +++	7439-92-1								

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		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
Lead (tetraethyl)	78-00-2			1.0E-07	I				
Linuron	330-55-2			7.7E-03	O				
Lithium	7439-93-2			2.0E-03	P				
Malathion	121-75-5			2.0E-02	I				
Maleic anhydride	108-31-6			1.0E-01	I			7.0E-04	C
Maleic hydrazide	123-33-1			5.0E-01	I				
Malononitrile	109-77-3			1.0E-04	P				
Mancozeb	8018-01-7			3.0E-02	H				
Maneb	12427-38-2			5.0E-03	I				
Manganese (non-food) +++	7439-96-5			1.4E-01	I			5.0E-05	I
Mephosfolan	950-10-7			9.0E-05	H				
Mepiquat chloride (Mepiquat)	24307-26-4			3.0E-02	I				
Mercury and compounds	7487-94-7			3.0E-04	I			3.0E-04	S
Mercury (elemental)	7439-97-6							3.0E-04	I
Mercury (methyl)	22967-92-6			1.0E-04	I				
Merphos	150-50-5			3.0E-05	I				
Merphos oxide	78-48-8			1.0E-04	O				
Metalaxyl	57837-19-1			6.0E-02	I				
Methacrylonitrile	126-98-7			1.0E-04	I			3.0E-02	P
Methamidophos	10265-92-6			5.0E-05	I				
Methanol	67-56-1			2.0E+00	I			2.0E+01	I
Methidathion	950-37-8			1.5E-03	O				
Methomyl	16752-77-5			2.5E-02	I				
Methoxychlor	72-43-5			5.0E-03	I				
2-Methoxyethanol	109-86-4			5.0E-03	P			2.0E-02	I
2-Methoxyethanol acetate	110-49-6			8.0E-03	P			1.0E-03	P
2-Methoxy-5-nitroaniline	99-59-2	4.9E-02	C			1.4E-05	C		
Methyl acetate	79-20-9			1.0E+00	X				
Methyl acrylate	96-33-3							2.0E-02	P
2-Methylaniline hydrochloride	636-21-5	1.3E-01	C			3.7E-05	C		
Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	17804-35-2			5.0E-02	I				
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	94-74-6			5.0E-04	I				
4-(2-Methyl-4-chlorophenoxy) butyric acid (MCPB)	94-81-5			4.4E-03	O				
2-(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)	93-65-2			1.0E-03	I				

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-1: TOXICITY VALUES

Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
4,4'-Methylenebisbenzeneamine	101-77-9	1.6E+00	C			4.6E-04	C	2.0E-02	C
4,4'-Methylene bis(2-chloroaniline)	101-14-4	1.0E-01	P	2.0E-03	P	4.3E-04	C		
4,4'-Methylene bis(N,N'-dimethyl)aniline	101-61-1	4.6E-02	I			1.3E-05	C		
Methylene bromide	74-95-3							4.0E-03	X
Methylene chloride	75-09-2	2.0E-03	I	6.0E-03	I	1.0E-08	I	6.0E-01	I
4,4'-Methylenediphenyl isocyanate	101-68-8							6.0E-04	I
2-(1-Methylethoxy)phenol methylcarbamate (Baygon)	114-26-1			4.0E-03	I				
Methyl ethyl ketone (2-Butanone)	78-93-3			6.0E-01	I			5.0E+00	I
Methyl isobutyl ketone (4-Methyl-2-pentanone)	108-10-1							3.0E+00	I
Methyl methacrylate	80-62-6			1.4E+00	I			7.0E-01	I
2-Methyl-5-nitroaniline	99-55-8	9.0E-03	P	2.0E-02	X				
Methyl parathion	298-00-0			2.5E-04	I				
2-Methylphenol	95-48-7			5.0E-02	I			6.0E-01	C
3-Methylphenol	108-39-4			5.0E-02	I			6.0E-01	C
4-Methylphenol	106-44-5			1.0E-01	A			6.0E-01	C
Methyl phosphonic acid	993-13-5			6.0E-02	X				
Methyl styrene (mixture)	25013-15-4			6.0E-03	H			4.0E-02	H
Methyl styrene (alpha)	98-83-9			7.0E-02	H				
Methyl tertbutyl ether (MTBE)	1634-04-4	1.8E-03	C			2.6E-07	C	3.0E+00	I
Metolaclor (Dual)	51218-45-2			1.5E-01	I				
Metribuzin	21087-64-9			2.5E-02	I				
Metsulfuron-methyl (Ally)	74223-64-6			2.5E-01	I				
Mirex	2385-85-5	1.8E+01	C	2.0E-04	I	5.1E-03	C		
Molinate	2212-67-1			2.0E-03	I				
Molybdenum	7439-98-7			5.0E-03	I				
Monochloramine	10599-90-3			1.0E-01	I				
Myclobutanil (Systhane)	88671-89-0			2.5E-02	I				
Naled	300-76-5			2.0E-03	I				
Napropamide	15299-99-7			1.2E-01	O				
Nickel and compounds	7440-02-0			2.0E-02	I	2.6E-04	C	9.0E-05	A
Nickel refinery dust	7440-02-0-NRD			1.1E-02	C	2.4E-04	I	1.4E-05	C
Nickel subsulfide	12035-72-2	1.7E+00	C	1.1E-02	C	4.8E-04	I	1.4E-05	C
Nitrate	14797-55-8			1.6E+00	I				
Nitrite	14797-65-0			1.0E-01	I				

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Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
2-Nitroaniline	88-74-4			1.0E-02	X			5.0E-05	X
Nitrobenzene	98-95-3			2.0E-03	I	4.0E-05	I	9.0E-03	I
Nitrofurantoin	67-20-9			7.0E-02	H				
Nitrofurazone	59-87-0	1.3E+00	C			3.7E-04	C		
Nitroglycerin	55-63-0	1.7E-02	P	1.0E-04	P				
Nitroguanidine	556-88-7			1.0E-01	I				
2-Nitropropane	79-46-9					2.7E-03	H	2.0E-02	I
N-Nitrosodi-n-butylamine	924-16-3	5.4E+00	I			1.6E-03	I		
N-Nitrosodiethanolamine	1116-54-7	2.8E+00	I			8.0E-04	C		
N-Nitrosodiethylamine	55-18-5	1.5E+02	I			4.3E-02	I		
N-Nitrosodimethylamine	62-75-9	5.1E+01	I	8.0E-06	P	1.4E-02	I	4.0E-05	X
N-Nitrosodiphenylamine	86-30-6	4.9E-03	I			2.6E-06	C		
N-Nitroso di-n-propylamine	621-64-7	7.0E+00	I			2.0E-03	C		
N-Nitroso-N-methylethylamine	10595-95-6	2.2E+01	I			6.3E-03	C		
N-Nitrosopyrrolidine	930-55-2	2.1E+00	I			6.1E-04	I		
m-Nitrotoluene	99-08-1			1.0E-04	X				
o-Nitrotoluene	88-72-2	2.2E-01	P	9.0E-04	P				
p-Nitrotoluene	99-99-0	1.6E-02	P	4.0E-03	P				
Norflurazon	27314-13-2			1.5E-02	O				
Octabromodiphenyl ether	32536-52-0			3.0E-03	I				
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0			5.0E-02	I				
Octamethylpyrophosphoramide	152-16-9			2.0E-03	H				
Oryzalin	19044-88-3	7.8E-03	O	1.4E-01	O				
Oxadiazon	19666-30-9			5.0E-03	I				
Oxamyl	23135-22-0			2.5E-02	I				
Oxyfluorfen	42874-03-3	7.3E-02	O	3.0E-02	O				
Paclobutrazol	76738-62-0			1.3E-02	I				
Paraquat [2]	4685-14-7			4.5E-03	I				
Parathion	56-38-2			6.0E-03	H				
Pebulate	1114-71-2			5.0E-02	H				
Pendimethalin	40487-42-1			3.0E-02	O				
Pentabromo-6-chloro cyclohexane	87-84-3	2.0E-02	X	2.0E-02	X				
Pentabromodiphenyl ether	32534-81-9			2.0E-03	I				
Pentachlorobenzene	608-93-5			8.0E-04	I				

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
Pentachloronitrobenzene	82-68-8	2.6E-01	H	3.0E-03	I				
Pentachlorophenol	87-86-5	4.0E-01	I	5.0E-03	I	5.1E-06	C		
Perchlorate	14797-73-0			7.0E-04	I				
Perfluoroalkyl Compounds									
Perfluoro-octanesulfonate (PFOS)^^ [3]	1763-23-1			2.0E-04	O				
Perfluorooctanoic acid (PFOA)^^ [4]	335-67-1	7.0E-02	O	2.0E-05	O				
Permethrin	52645-53-1			5.0E-02	I				
Phenmedipham	13684-63-4			2.4E-01	O				
Phenol	108-95-2			3.0E-01	I			2.0E-01	C
m-Phenylenediamine	108-45-2			6.0E-03	I				
p-Phenylenediamine	106-50-3			1.0E-03	X				
Phenylmercuric acetate	62-38-4			8.0E-05	I				
2-Phenylphenol	90-43-7	1.9E-03	H						
Phorate	298-02-2			2.0E-04	H				
Phosmet	732-11-6			2.0E-02	I				
Phosphine	7803-51-2			3.0E-04	I			3.0E-04	I
Phosphoric acid	7664-38-2			4.9E+01	P			1.0E-02	I
Phosphorus (white)	7723-14-0			2.0E-05	I				
p-Phthalic acid	100-21-0			1.0E+00	H				
Phthalic anhydride	85-44-9			2.0E+00	I			2.0E-02	C
Picloram	1918-02-1			7.0E-02	I				
Pirimiphos-methyl	29232-93-7			7.0E-05	O				
Polybrominated biphenyls (PBBs) [5]	59536-65-1	3.0E+01	C	7.0E-06	H	8.6E-03	C		
Polychlorinated biphenyls (PCBs)	1336-36-3	2.0E+00	I			5.7E-04	I		
Aroclor 1016	12674-11-2	7.0E-02	S	7.0E-05	I	2.0E-05	S		
Aroclor 1221	11104-28-2	2.0E+00	S			5.7E-04	S		
Aroclor 1232	11141-16-5	2.0E+00	S			5.7E-04	S		
Aroclor 1242	53469-21-9	2.0E+00	S			5.7E-04	S		
Aroclor 1248	12672-29-6	2.0E+00	S			5.7E-04	S		
Aroclor 1254	11097-69-1	2.0E+00	S	2.0E-05	I	5.7E-04	S		
Aroclor 1260	11096-82-5	2.0E+00	S			5.7E-04	S		
Polynuclear aromatic hydrocarbons (PAHs)									
Acenaphthene	83-32-9			6.0E-02	I				
Anthracene	120-12-7			3.0E-01	I				

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-1: TOXICITY VALUES

Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
Benz[a]anthracene	56-55-3	1.0E-01	E			6.0E-05	E		
Benzo[a]pyrene	50-32-8	1.0E+00	I	3.0E-04	I	6.0E-04	I	2.0E-06	I
Benzo[b]fluoranthene	205-99-2	1.0E-01	E			6.0E-05	E		
Benzo[k]fluoranthene	207-08-9	1.0E-02	E			6.0E-06	E		
Chrysene	218-01-9	1.0E-03	E			6.0E-07	E		
Dibenz[ah]anthracene	53-70-3	1.0E+00	E			6.0E-04	E		
Fluoranthene	206-44-0			4.0E-02	I				
Fluorene	86-73-7			4.0E-02	I				
Indeno[1,2,3-cd]pyrene	193-39-5	1.0E-01	E			6.0E-05	E		
Naphthalene	91-20-3			2.0E-02	I	3.4E-05	C	3.0E-03	I
Pyrene	129-00-0			3.0E-02	I				
Prochloraz	67747-09-5	1.5E-01	I	9.0E-03	I				
Profluralin	26399-36-0			6.0E-03	H				
Prometon	1610-18-0			1.5E-02	I				
Prometryn	7287-19-6			4.0E-02	O				
Propyzamide (Pronamide)	23950-58-5			7.5E-02	I				
Propachlor	1918-16-7			1.3E-02	I				
Propanil	709-98-8			5.0E-03	I				
Propargite	2312-35-8	1.9E-01	O	4.0E-02	O				
Propargyl alcohol	107-19-7			2.0E-03	I				
Propazine	139-40-2			2.0E-02	I				
Propham	122-42-9			2.0E-02	I				
Propiconazole	60207-90-1			1.0E-01	O				
n-Propylbenzene	103-65-1			1.0E-01	X			1.0E+00	X
Propylene glycol	57-55-6			2.0E+01	P				
Propylene glycol, monoethyl ether [6]	52125-53-8			7.0E-01	H			2.0E+00	I
Propylene glycol, monomethyl ether	107-98-2			7.0E-01	H			2.0E+00	I
Propylene oxide	75-56-9	2.4E-01	I			3.7E-06	I	3.0E-02	I
Pyridine	110-86-1			1.0E-03	I				
Quinalphos	13593-03-8			5.0E-04	I				
Quinoline	91-22-5	3.0E+00	I						
Resmethrin	10453-86-8			3.0E-02	I				
Ronnel	299-84-3			5.0E-02	H				
Rotenone	83-79-4			4.0E-03	I				

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-1: TOXICITY VALUES

Contaminant	CAS	SFo		RfDo		IUR		RfCi	
		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
Selenious Acid	7783-00-8			5.0E-03	I				
Selenium	7782-49-2			5.0E-03	I			2.0E-02	C
Sethoxydim	74051-80-2			1.4E-01	O				
Silver and compounds	7440-22-4			5.0E-03	I				
Simazine	122-34-9	1.2E-01	H	5.0E-03	I				
Sodium azide	26628-22-8			4.0E-03	I				
Sodium diethyldithiocarbamate	148-18-5	2.7E-01	H	3.0E-02	I				
Sodium fluoroacetate	62-74-8			2.0E-05	I				
Sodium metavanadate	13718-26-8			1.0E-03	H				
Strontium, stable	7440-24-6			6.0E-01	I				
Strychnine	57-24-9			3.0E-04	I				
Styrene	100-42-5			2.0E-01	I			1.0E+00	I
1,1'-Sulfonylbis (4-Chlorobenzene)	80-07-9			8.0E-04	P				
Tebuthiuron	34014-18-1			7.0E-02	I				
Temephos	3383-96-8			2.0E-02	H				
Terbacil	5902-51-2			1.3E-02	I				
Terbufos	13071-79-9			2.5E-05	H				
Terbutryn	886-50-0			1.0E-03	I				
1,2,4,5-Tetrachlorobenzene	95-94-3			3.0E-04	I				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (Dioxin) [7]	1746-01-6	1.3E+05	C	7.0E-10	I	3.8E+01	C	4.0E-08	C
1,1,1,2-Tetrachloroethane	630-20-6	2.6E-02	I	3.0E-02	I	7.4E-06	I		
1,1,2,2-Tetrachloroethane	79-34-5	2.0E-01	I	2.0E-02	I	5.8E-05	C		
Tetrachloroethylene (PCE)	127-18-4	2.1E-03	I	6.0E-03	I	2.6E-07	I	4.0E-02	I
2,3,4,6-Tetrachlorophenol	58-90-2			3.0E-02	I				
p,a,a,a-Tetrachlorotoluene	5216-25-1	2.0E+01	H						
Tetrachlorovinphos (Stirofos)	961-11-5	2.4E-02	H	3.0E-02	I				
Tetraethyldithiopyrophosphate	3689-24-5			5.0E-04	I				
Thallium and compounds	7440-28-0			1.0E-05	X				
Thiobencarb	28249-77-6			1.0E-02	I				
Thiofanox	39196-18-4			3.0E-04	H				
Thiophanate-methyl	23564-05-8	1.2E-02	O	2.7E-02	O				
Thiram	137-26-8			1.5E-02	O				
Tin and compounds	7440-31-5			6.0E-01	H				
Toluene	108-88-3			8.0E-02	I			5.0E+00	I

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-1: TOXICITY VALUES

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		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
p-Toluidine	106-49-0	3.0E-02	P	4.0E-03	X				
Tralomethrin	66841-25-6			7.5E-03	I				
Triadimefon (Bayleton)	43121-43-3			3.4E-02	O				
Triallate	2303-17-5	7.2E-02	O	2.5E-02	O				
Triasulfuron	82097-50-5			1.0E-02	I				
Tribenuron-methyl (Express)	101200-48-0			8.0E-03	I				
1,2,4-Tribromobenzene	615-54-3			5.0E-03	I				
Tributyltin oxide (TBTO)	56-35-9			3.0E-04	I				
2,4,6-Trichloroaniline	634-93-5	7.0E-03	X	3.0E-05	X				
2,4,6-Trichloroaniline hydrochloride	33663-50-2	2.9E-02	H						
1,2,4-Trichlorobenzene	120-82-1	2.9E-02	P	1.0E-02	I			2.0E-03	P
1,1,1-Trichloroethane	71-55-6			2.0E+00	I			5.0E+00	I
1,1,2-Trichloroethane	79-00-5	5.7E-02	I	4.0E-03	I	1.6E-05	I	2.0E-04	X
Trichloroethylene (TCE) Long-term +++	79-01-6	4.6E-02	I	5.0E-04	I	4.1E-06	I	2.0E-03	I
Trichlorofluoromethane	75-69-4			3.0E-01	I				
2,4,5-Trichlorophenol	95-95-4			1.0E-01	I				
2,4,6-Trichlorophenol	88-06-2	1.1E-02	I	1.0E-03	P	3.1E-06	I		
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	93-76-5			1.0E-02	I				
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	93-72-1			8.0E-03	I				
1,1,2-Trichloropropane	598-77-6			5.0E-03	I				
1,2,3-Trichloropropane	96-18-4	3.0E+01	I	4.0E-03	I			3.0E-04	I
1,2,3-Trichloropropene	96-19-5			3.0E-03	X			3.0E-04	P
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1			3.0E+01	I			5.0E+00	P
Tridiphane	58138-08-2			3.0E-03	I				
Triethylamine	121-44-8							7.0E-03	I
Trifluralin	1582-09-8	7.7E-03	I	7.5E-03	I				
1,2,4-Trimethylbenzene	95-63-6			1.0E-02	I			6.0E-02	I
1,3,5-Trimethylbenzene	108-67-8			1.0E-02	I			6.0E-02	I
Trimethyl phosphate	512-56-1	2.0E-02	P	1.0E-02	P				
1,3,5-Trinitrobenzene	99-35-4			3.0E-02	I				
Trinitrophenylmethylnitramine (Tetryl)	479-45-8			2.0E-03	P				
2,4,6-Trinitrotoluene (TNT)	118-96-7	3.0E-02	I	5.0E-04	I				
Triphenylphosphine oxide	791-28-6			2.0E-02	P				
Tris(2-chloroethyl) phosphate	115-96-8	2.0E-02	P	7.0E-03	P				

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		$(mg/kg\text{-}d)^{-1}$	Ref	(mg/kg-d)	Ref	$1/(\mu g/m^3)$	Ref	(mg/m^3)	Ref
Uranium (chemical toxicity only)	7440-61-0			2.0E-04	A			4.0E-05	A
Vanadium and compounds +++	7440-62-2			5.0E-03	S			1.0E-04	A
Vernolate (Vernam)	1929-77-7			1.0E-03	I				
Vinclozolin	50471-44-8			1.2E-03	O				
Vinyl acetate	108-05-4			1.0E+00	H			2.0E-01	I
Vinyl bromide	593-60-2					3.2E-05	H	3.0E-03	I
Vinyl chloride +++	75-01-4	7.2E-01	I	3.0E-03	I	4.4E-06	I	1.0E-01	I
Warfarin	81-81-2			3.0E-04	I				
Xylenes	1330-20-7			2.0E-01	I			1.0E-01	I
Zinc	7440-66-6			3.0E-01	I				
Zinc phosphide	1314-84-7			3.0E-04	I				
Zineb	12122-67-7			5.0E-02	I				

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-1: TOXICITY VALUES

Notes:

* At VCP sites where chromium is a potential contaminant of concern, such as a former metal plating facility, the VCP applicant should collect media samples for both Chromium III and Chromium VI analyses.

+++ See Section 5.4 of Appendix A, Protocol for VCP Remediation Goal Lookup Tables, Nebraska Voluntary Cleanup Program for more information.

[1] Toxicity values for antimony potassium tartrate are not included in the RSL tables (EPA 2018a). HEAST (EPA 2011) value used.

[2] Toxicity values for Paraquat are not included in the RSL tables (EPA 2018a). The RfD for Paraquat dichloride was used as a surrogate value.

[3] The toxicity values for perfluorooctane sulfonate are based on values produced by the EPA Office of Water (EPA 2016a).

[4] The toxicity values for perfluorooctane acid are based on values produced by the EPA Office of Water (EPA 2016b).

[5] The toxicity values for polybrominated biphenyls are not included in RSL tables (EPA 2018a). Source of values as noted.

[6] Toxicity values for propylene glycol, monoethyl ether are not included in the RSL tables (EPA 2018a). The RfD for propylene glycol, monomethyl ether was used as a surrogate value.

[7] See RSL User's Guide (EPA 2018b) Section 2.3.5 for more information on the toxicity of dioxins.

Reference Key:

A = ATSDR
C = Cal EPA
H = HEAST
I = IRIS
O = USEPA Office of Water
P = PPRTV
X = PPRTV Appendix

CAS = Chemical abstract service number
IUR = Inhalation unit risk
µg/m^3 = micrograms per cubic meter
mg/kg-d = milligrams per kilogram body weight per day
mg/m^3 = milligrams per cubic meter
RfC_i = Reference concentration inhalation
RfDo = Reference dose oral
SFo = Slope factor oral

Sources:

U.S. Environmental Protection Agency (EPA). 2011. Health Effects Assessment Summary Tables for Superfund (HEAST). December.
EPA. 2016a. Health Effects Support Document for Perfluorooctane Sulfonate (PFOS), Office of Water. EPA 822-R-16-002. May
EPA. 2016b. Health Effects Support Document for Perfluorooctanoic Acid (PFOA). Office of Water. EPA 822-R-16-003. May.
EPA. 2017a. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites. November.
EPA. 2017b. Regional Screening Levels (RSLs) -- User's Guide. November.

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-2: CHEMICAL-SPECIFIC PARAMETERS

Version Date: September 2018
Source of chemical and physical parameters: EPA RSLs May 2018, except as noted

Contaminant	CAS	MW (g/mol)	Organic/ Inorganic	Henry's Law Constant H_units (atm-m³/mol)	Henry's Law Constant H' (H_unitless) (unitless)	VP>1?	VOL	D_i (cm²/s)	D_w (cm²/s)	K_{oc} (organics) (cm³/g)	K_d (inorganics) (cm³/g)	$K_{d\ VF}$ (cm³/g)	K_d_s_to_gw (cm³/g)	S (mg/L-water)	S (µg/L-water)	D_A (cm²/s)	VF (m³/kg)	SAT (mg/kg)	soil-to-gw factor (kg/L)	ABS_d	ABS_{GI}	Title 118 MCL (µg/L)	EPA Fed MCL (µg/L)	Kp.org (cm/hr)	Kp.inorg (cm/hr)	t_star (hr)	FA (unitless)	tau_event (hr)	B (unitless)	RBA (unitless)	Mutagen	In EPD?
Acephate	30560-19-1	1.8E+02	O	5.0E-13	2.0E-11	No	0	3.7E-02	8.0E-06	1.0E+01		2.0E-02	2.0E-02	8.2E+05	8.2E+08			9.8E+04	2.2E-01	0.1	1			4.0E-05		2.7E+00	1.0E+00	1.1E+00	2.1E-04	1		Yes
Acetaldehyde	75-07-0	4.4E+01	O	6.7E-05	2.7E-03	Yes	1	1.3E-01	1.4E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09	1.8E-04	8.7E+03	1.0E+05	2.0E-01		1			5.3E-04		4.5E-01	1.0E+00	1.9E-01	1.3E-03	1		Yes
Acetochlor	34256-82-1	2.7E+02	O	2.2E-08	9.1E-07	No	0	2.2E-02	5.6E-06	3.0E+02		6.0E-01	6.0E-01	2.2E+02	2.2E+05			1.6E+02	8.0E-01	0.1	1			5.0E-03		8.2E+00	9.0E-01	3.4E+00	3.1E-02	1		Yes
Acetone	67-64-1	5.8E+01	O	3.5E-05	1.4E-03	Yes	1	1.1E-01	1.2E-05	2.4E+00		4.7E-03	4.7E-03	1.0E+06	1.0E+09	7.8E-05	1.4E+04	1.0E+05	2.0E-01		1			5.1E-04		5.3E-01	1.0E+00	2.2E-01	1.5E-03	1		Yes
Acetone cyanohydrin	75-86-5	8.5E+01	O	2.0E-09	8.1E-08	No	0	8.6E-02	1.0E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09			1.0E+05	2.0E-01	0.1	1			5.0E-04		7.6E-01	1.0E+00	3.2E-01	1.8E-03	1		Yes
Acetonitrile	75-05-8	4.1E+01	O	3.5E-05	1.4E-03	Yes	1	1.3E-01	1.4E-05	4.7E+00		9.3E-03	9.3E-03	1.0E+06	1.0E+09	9.3E-05	1.3E+04	1.1E+05	2.1E-01		1			5.5E-04		4.3E-01	1.0E+00	1.8E-01	1.4E-03	1		Yes
Acrolein	107-02-8	5.6E+01	O	1.2E-04	5.0E-03	Yes	1	1.1E-01	1.2E-05	1.0E+00		2.0E-03	2.0E-03	2.1E+05	2.1E+08	2.9E-04	6.9E+03	2.2E+04	2.0E-01		1			7.5E-04		5.2E-01	1.0E+00	2.2E-01	2.2E-03	1		Yes
Acrylamide	79-06-1	7.1E+01	O	1.7E-09	7.0E-08	No	0	1.1E-01	1.3E-05	5.7E+00		1.1E-02	1.1E-02	3.9E+05	3.9E+08			4.3E+04	2.1E-01	0.1	1			2.2E-04		6.3E-01	1.0E+00	2.6E-01	7.3E-04	1	M	Yes
Acrylic acid	79-10-7	7.2E+01	O	3.7E-07	1.5E-05	Yes	1	1.0E-01	1.2E-05	1.4E+00		2.9E-03	2.9E-03	1.0E+06	1.0E+09	1.5E-06	9.5E+04	1.0E+05	2.0E-01		1			1.1E-03		6.4E-01	1.0E+00	2.7E-01	3.4E-03	1		Yes
Acrylonitrile	107-13-1	5.3E+01	O	1.4E-04	5.6E-03	Yes	1	1.1E-01	1.2E-05	8.5E+00		1.7E-02	1.7E-02	7.5E+04	7.5E+07	2.9E-04	7.7E+03	8.8E+03	2.2E-01		1			1.2E-03		5.0E-01	1.0E+00	2.1E-01	3.3E-03	1		Yes
Alachlor	15972-60-8	2.7E+02	O	8.3E-09	3.4E-07	No	0	2.3E-02	5.7E-06	3.1E+02		6.2E-01	6.2E-01	2.4E+02	2.4E+05			1.7E+02	8.2E-01	0.1	1	2	2	1.1E-02		8.2E+00	9.0E-01	3.4E+00	6.6E-02	1		Yes
Aldicarb	116-06-3	1.9E+02	O	1.4E-09	5.9E-08	No	0	3.2E-02	7.2E-06	2.5E+01		4.9E-02	4.9E-02	6.0E+03	6.0E+06			9.0E+02	2.5E-01	0.1	1		3	7.6E-04		2.9E+00	1.0E+00	1.2E+00	4.0E-03	1		Yes
Aldicarb sulfone	1646-88-4	2.2E+02	O	3.4E-09	1.4E-07	No	0	5.2E-02	6.1E-06	1.0E+01		2.0E-02	2.0E-02	1.0E+04	1.0E+07			1.2E+03	2.2E-01	0.1	1		2	3.7E-05		4.4E+00	1.0E+00	1.8E+00	2.1E-04	1		Yes
Aldrin	309-00-2	3.6E+02	O	4.4E-05	1.8E-03	No	1	2.3E-02	5.8E-06	8.2E+04		1.6E+02	1.6E+02	1.7E-02	1.7E+01	1.4E-08	1.7E+06	2.8E+00	1.6E+02		1			2.9E-01		4.8E+01	1.0E+00	1.2E+01	2.2E+00	1		No
Allyl alcohol	107-18-6	5.8E+01	O	5.0E-06	2.0E-04	Yes	1	1.1E-01	1.2E-05	1.9E+00		3.8E-03	3.8E-03	1.0E+06	1.0E+09	1.2E-05	3.4E+04	1.0E+05	2.0E-01		1			9.6E-04		5.3E-01	1.0E+00	2.2E-01	2.8E-03	1		Yes
Allyl chloride	107-05-1	7.7E+01	O	1.1E-02	4.5E-01	Yes	1	9.4E-02	1.1E-05	4.0E+01		7.9E-02	7.9E-02	3.4E+03	3.4E+06	8.5E-03	1.6E+03	8.9E+02	3.2E-01		1			1.1E-02		6.8E-01	1.0E+00	2.8E-01	3.8E-02	1		Yes
Aluminum	7429-90-5	2.7E+01	I			No	0				1.5E+03	1.5E+03	1.5E+03						1.5E+03		1	50			1.0E-03	3.6E-01	1.0E+00	1.5E-01	2.0E-03	1		Yes
Aluminum phosphide	20859-73-8	5.8E+01	I			No	0														1				1.0E-03	5.3E-01	1.0E+00	2.2E-01	2.9E-03	1		Yes
Ametryn	834-12-8	2.3E+02	O	2.4E-09	9.9E-08	No	0	5.1E-02	6.0E-06	4.3E+02		8.6E-01	8.6E-01	2.1E+02	2.1E+05			2.0E+02	1.1E+00	0.1	1			7.9E-03		4.7E+00	1.0E+00	2.0E+00	4.6E-02	1		Yes
m-Aminophenol	591-27-5	1.1E+02	O	2.0E-10	8.1E-09	No	0	8.3E-02	9.7E-06	9.0E+01		1.8E-01	1.8E-01	2.7E+04	2.7E+07			7.6E+03	3.8E-01	0.1	1			5.3E-04		1.0E+00	1.0E+00	4.3E-01	2.1E-03	1		Yes
Amitraz	33089-61-1	2.9E+02	O	9.9E-06	4.0E-04	No	0	2.2E-02	5.4E-06	2.6E+05		5.1E+02	5.1E+02	1.0E+00	1.0E+03			5.1E+02	5.1E+02	0.1	1			1.6E-01		1.8E+01	9.0E-01	4.6E+00	1.1E+00	1		Yes
Ammonia +++	7664-41-7	1.7E+01	I	1.6E-05	6.6E-04	Yes	1	2.3E-01	2.2E-05					4.8E+05	4.8E+08						1				1.0E-03	3.1E-01	1.0E+00	1.3E-01	1.6E-03	1		
Ammonium sulfamate	7773-06-0	1.1E+02	I			No	0							1.3E+06	1.3E+09						1				1.0E-03	1.1E+00	1.0E+00	4.6E-01	4.1E-03	1		Yes
Aniline	62-53-3	9.3E+01	O	2.0E-06	8.3E-05	No	0	8.3E-02	1.0E-05	7.0E+01		1.4E-01	1.4E-01	3.6E+04	3.6E+07			8.7E+03	3.4E-01	0.1	1			1.9E-03		8.4E-01	1.0E+00	3.5E-01	6.9E-03	1		Yes
Antimony and compounds	7440-36-0	1.2E+02	I			No	0				4.5E+01	4.5E+01	4.5E+01						4.5E+01		0.15	6	6		1.0E-03	1.2E+00	1.0E+00	5.1E-01	4.2E-03	1		Yes
Antimony pentoxide	1314-60-9	3.2E+02	I			No	0							3.0E+03	3.0E+06						0.15				1.0E-03	1.6E+01	1.0E+00	6.8E+00	6.9E-03	1		Yes
Antimony potassium tartrate	28300-74-5	6.7E+02	I			No	0							5.3E+04	5.3E+07						0.15	6			1.0E-03					1		Yes
Antimony tetroxide	1332-81-6	3.1E+02	I			No	0														0.15				1.0E-03	1.3E+01	1.0E+00	5.5E+00	6.7E-03	1		Yes
Antimony trioxide	1309-64-4	2.9E+02	I			No	0														0.15				1.0E-03	1.1E+01	1.0E+00	4.5E+00	6.6E-03	1		Yes
Arsenic (inorganic) +++	7440-38-2	6.7E+02	I			No	0							5.3E+04	5.3E+07						0.15	10	10		1.0E-03					1		Yes
Arsine	7784-42-1	7.8E+01	O			No	0							2.0E+05	2.0E+08						1			1.0E-03		6.9E-01	1.0E+00	2.9E-01	3.4E-03	1		Yes
Assure	76578-14-8	3.7E+02	O	1.1E-08	4.3E-07	No	0	3.7E-02	4.3E-06	7.7E+03		1.5E+01	1.5E+01	3.0E-01	3.0E+02			4.7E+00	1.6E+01	0.1	1			8.9E-03		3.1E+01	9.0E-01	1.3E+01	6.6E-02	1		Yes
Asulam	3337-71-1	2.3E+02	O	1.7E-12	7.0E-11	No	0	5.1E-02	5.9E-06	2.8E+01		5.6E-02	5.6E-02	5.0E+03	5.0E+06			7.8E+02	2.6E-01	0.1	1			5.3E-05		4.9E+00	1.0E+00	2.0E+00	3.1E-04	1		Yes
Atrazine	1912-24-9	2.2E+02	O	2.4E-09	9.6E-08	No	0	2.6E-02	6.8E-06	2.2E+02		4.5E-01	4.5E-01	3.5E+01	3.5E+04			1.9E+01	6.5E-01	0.1	1	3	3	5.2E-03		4.1E+00	1.0E+00	1.7E+00	3.0E-02	1		Yes
Avermectin B1	65195-55-3	8.8E+02	O	1.3E-27	5.4E-26	No	0	2.1E-02	2.4E-06	8.8E+05		1.8E+03	1.8E+03	3.5E-04	3.5E-01			6.1E-01	1.8E+03	0.1	1			1.8E-05		2.0E+04	1.0E+00	8.4E+03	2.1E-04	1		No
Azobenzene	103-33-3	1.8E+02	O	1.4E-05	5.5E-04	No	1	3.6E-02	7.5E-06	3.8E+03		7.5E+00	7.5E+00	6.4E+00	6.4E+03	1.4E-07	5.2E+05	4.9E+01	7.7E+00		1			5.1E-02		2.6E+00	1.0E+00	1.1E+00	2.7E-01	1		Yes
Barium and compounds	7440-39-3	1.4E+02	I			No	0				4.1E+01	4.1E+01	4.1E+01						4.1E+01		0.07	2000	2000		1.0E-03	1.5E+00	1.0E+00	6.2E-01	4.5E-03	1		Yes
Benfluralin (Benefin)	1861-40-1	3.4E+02	O	2.9E-04	1.2E-02	No	1	2.2E-02	5.5E-06	1.6E+04		3.3E+01	3.3E+01	1.0E-01	1.0E+02	4.2E-07	3.1E+05	3.3E+00	3.3E+01		1			6.8E-02		1.9E+01	8.0E-01	7.9E+00	4.8E-01	1		Yes
Bensulfuron-methyl (Londax)	83055-99-6	4.1E+02	O	3.8E-15	1.5E-13	No	0	3.4E-02	4.0E-06	2.8E+01		5.6E-02	5.6E-02	1.2E+02	1.2E+05			1.9E+01	2.6E-01	0.1	1			2.2E-04		5.0E+01	1.0E+00	2.1E+01	1.7E-03	1		Yes
Bentazone (Bentazon)	25057-89-0	2.4E+02	O	2.2E-09	8.9E-08	No	0	4.9E-02	5.7E-06	1.0E+01		2.0E-02	2.0E-02	5.0E+02	5.0E+05			6.0E+01	2.2E-01	0.1	1			2.5E-03		5.6E+00	1.0E+00	2.3E+00	1.5E-02	1		Yes
Benzaldehyde	100-52-7	1.1E+02	O	2.7E-05	1.1E-03	Yes	1	7.4E-02	9.5E-06	1.1E+01		2.2E-02	2.2E-02	7.0E+03	7.0E+06	3.6E-05	2.2E+04	8.5E+02	2.2E-01		1			3.8E-03		9.9E-01	1.0E+00	4.1E-01	1.5E-02	1		Yes
Benzene	71-43-2	7.8E+01	O	5.6E-03	2.3E-01	Yes	1	9.0E-02	1.0E-05	1.5E+02		2.9E-01	2.9E-01	1.8E+03	1.8E+06	2.5E-03	3.5E+03	7.8E+02	5.1E-01		1	5	5	1.5E-02		6.9E-01	1.0E+00	2.9E-01	5.1E-02	1		Yes
Benzidine	92-87-5	1.8E+02	O	5.2E-11	2.1E-09	No	0	3.5E-02	7.5E-06	1.2E+03		2.4E+00	2.4E+00	3.2E+02	3.2E+05			8.0E+02	2.6E+00	0.1	1			1.1E-03		2.7E+00	1.0E+00	1.1E+00	5.9E-03	1	M	Yes
Benzoic acid	65-85-0	1.2E+02	O	3.8E-08	1.6E-06	No	0	7.0E-02	9.8E-06	6.0E-01		1.2E-03	1.2E-03	3.4E+03	3.4E+06			3.4E+02	2.0E-01	0.1	1			5.7E-03		1.2E+00	1.0E+00	5.1E-01	2.4E-02	1		Yes
Benzotrichloride	98-07-7	2.0E+02	O	2.6E-04	1.1E-02	No	1	3.1E-02	7.7E-06	1.0E+03		2.0E+00	2.0E+00	5.3E+01	5.3E+04	8.4E-06	6.8E+04	1.1E+02	2.2E+00		1			4.9E-02		3.1E+00	1.0E+00	1.3E+00	2.6E-01	1		Yes
Benzyl alcohol	100-51-6	1.1E+02	O	3.4E-07	1.4E-05	No	0	7.3E-02	9.4E-06	2.1E+01		4.3E-02	4.3E-02	4.3E+04	4.3E+07			6.1E+03	2.4E-01	0.1	1			2.1E-03		1.0E+00	1.0E+00	4.2E-01	8.4E-03	1		Yes
Benzyl chloride	100-44-7	1.3E+02	O	4.1E-04	1.7E-02	Yes	1	6.3E-02	8.8E-06	4.5E+02		8.9E-01	8.9E-01	5.3E+02	5.3E+05	5.7E-05	2.5E+04	5.2E+02	1.1E+00		1			1.0E-02		1.3E+00	1.0E+00	5.4E-01	4.5E-02	1		Yes
Beryllium and compounds	7440-41-7	9.0E+00	I			No	0				7.9E+02	7.9E+02	7.9E+02						7.9E+02		0.007	4	4		1.0E-03	2.8E-01	1.0E+00	1.2E-01	1.2E-03	1		Yes
Biphenthrin (Talstar)	82657-04-3	4.2E+02	O	1.0E-06	4.1E-05	No	0	1.8E-02	4.5E-06	2.3E+06		4.5E+03	4.5E+03	1.0E-03	1.0E+00			4.5E+00	4.5E+03	0.1	1			1.7E+00		1.1E+02	0.0E+00	2.5E+01	1.4E+01	1		Yes
1,1-Biphenyl	92-52-4	1.5E+02	O	3.1E-04	1.3E-02	No	1	4.7E-02	7.6E-06	5.1E+03		1.0E+01	1.0E+01	7.5E+00	7.5E+03	3.1E-06	1.1E+05	7.7E+01	1.0E+01		1			9.4E-02		1.8E+00	1.0E+00	7.7E-01	4.5E-01	1		Yes
Bis(2-chloroethyl)ether	111-44-4	1.4E+02	O	1.7E-05	7.0E-04	Yes	1	5.7E-02	8.7E-06	3.2E+01		6.4E-02	6.4E-02	1.7E+04	1.7E+07	1.3E-05	4.3E+04	2.8E+03	2.6E-01		1			1.8E-03		1.6E+00	1.0E+00	6.6E-01	8.2E-03	1		Yes
Bis(chloromethyl)ether	542-88-1	1.1E+02	O	4.4E-03	1.8E-01	Yes	1	7.6E-02	1.0E-05	9.7E+00		1.9E-02	1.9E-02	2.2E+04	2.2E+07	4.7E-03	1.9E+03	3.4E+03	2.4E-01		1			8.6E-04		1.1E+00	1.0E+00	4.6E-01	3.5E-03	1		Yes
Bis(2-chloro-1-methylethyl)ether	108-60-1	1.7E+02	O	7.4E-05	3.0E-03	No	1	4.0E-02	7.4E-06	8.3E+01		1.7E-01	1.7E-01	1.7E+03	1.7E+06	2.4E-05	3.5E+04	4.5E+02	3.7E-01		1			7.6E-03		2.3E+00	1.0E+00	9.5E-01	3.8E-02	1		Yes
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	3.9E+02	O	2.7E-07	1.1E-05	No	0	1.7E-02	4.2E-06	1.2E+05		2.4E+02	2.4E+02	2.7E-01	2.7E+02			6.5E+01	2.4E+02	0.1	1	6	6	1.1E+00		7.3E+01	8.0E-01	1.6E+01	8.6E+00	1		No
Bisphenol A	80-05-7	2.3E+02	O	1.0E-11	4.1E-10	No	0	2.5E-02	6.5E-06	3.8E+04		7.5E+01	7.5E+01	1.2E+02	1.2E+05			9.1E+03	7.6E+01	0.1	1			1.3E-02		4.8E+00	1.0E+00	2.0E+00	7.7E-02	1		Yes
Boron	7440-42-8	1.4E+01	I			No	0				3.0E+00	3.0E+00	3.0E+00						3.2E+00		1				1.0E-03	3.0E-01	1.0E+00	1.3E-01	1.4E-03	1		Yes
Boron trifluoride	7637-07-2	6.8E+01	I			Yes	1	1.6E-01	2.2E-05					3.3E+06	3.3E+09						1				1.0E-03	6.1E-01	1.0E+00	2.5E-01	3.2E-03	1		Yes
Bromate	15541-45-4	8.0E+01	I			No	0				7.5E+00	7.5E+00	7.5E+00						7.7E+00		1		10		1.0E-03	7.1E-01	1.0E+00	2.9E-01	3.4E-03	1		Yes
Bromobenzene	108-86-1	1.6E+02	O	2.5E-03	1.0E-01	Yes	1	5.4E-02	9.3E-06	2.3E+02		4.7E-01	4.7E-01	4.5E+02	4.5E+05	4.9E-04	8.4E+03	2.6E+02	6.8E-01		1			2.0E-02		1.9E+00	1.0E+00	8.0E-01	9.6E-02	1		Yes
Bromodichloromethane	75-27-4	1.6E+02	O	2.1E-03	8.7E-02	Yes	1	5.6E-02	1.1E-05	3.2E+01		6.4E-02	6.4E-02	3.0E+03	3.0E+06	1.4E-03	4.0E+03	5.5E+02	2.7E-01		1	100	80	4.0E-03		2.1E+00	1.0E+00	8.7E-01	2.0E-02	1		Yes
Bromoform (Tribromomethane)	75-25-2	2.5E+02	O	5.4E-04	2.2E-02	Yes	1	3.6E-02	1.0E-05	3.2E+01		6.4E-02	6.4E-02	3.1E+03	3.1E+06	2.5E-04	9.7E+03	5.2E+02	2.7E-01		1	100	80	2.4E-03		6.6E+00	1.0E+00	2.7E+00	1.4E-02	1		Yes
Bromomethane	74-83-9	9.5E+01	O	7.3E-03	3.0E-01	Yes	1	1.0E-01	1.4E-05	1.3E+01		2.6E-02	2.6E-02	1.5E+04	1.5E+07	8.8E-03	1.4E+03	2.8E+03	2.5E-01		1			2.8E-03		8.6E-01	1.0E+00	3.6E-01	1.1E-02	1		Yes
Bromophos	2104-96-3	3.7E+02	O	2.1E-04	8.4E-03	No	1	2.3E-02	6.1E-06	2.0E+03		4.0E+00	4.0E+00	3.0E-01	3.0E+02	2.5E-06	1.2E+05	1.2E+00	4.2E+00		1			4.0E-02		2.8E+01	8.0E-01	1.2E+01	3.0E-01	1		Yes
Bromoxynil	1689-84-5	2.8E+02	O	1.3E-10	5.4E-09	No	0	4.5E-02	5.2E-06	3.3E+02		6.6E-01	6.6E-01	1.3E+02	1.3E+05			9.9E+01	8.6E-01	0.1	1			7.8E-03		9.0E+00	9.0E-01	3.7E+00	5.0E-02	1		Yes
Bromoxynil octanoate	1689-99-2	4.0E+02	O	3.2E-05	1.3E-03	No	1	2.1E-02	5.4E-06	4.3E+03		8.5E+00	8.5E+00	8.0E-02	8.0E+01	1.8E-07	4.7E+05	6.9E-01	8.7E+00		1			3.3E-02		4.6E+01	8.0E-01	1.9E+01	2.6E-01	1		Yes
1,3-Butadiene	106-99-0	5.4E+01	O	7.4E-02	3.0E+00	Yes	1	1.0E-01	1.0E-05	4.0E+01		7.9E-02	7.9E-02	7.4E+02	7.4E+05	2.1E-02	8.7E+02	5.5E+02	5.5E-01		1			1.6E-02		5.1E-01	1.0E+00	2.1E-01	4.6E-02	1		Yes
1-Butanol	71-36-3	7.4E+01	O	8.8E-06	3.6E-04	Yes	1	9.0E-02	1.0E-05	3.5E+00		6.9E-03	6.9E-03	6.3E+04	6.3E+07	1.7E-05	3.0E+04	6.8E+03	2.1E-01		1			2.3E-03		6.6E-01	1.0E+00	2.7E-01	7.6E-03	1		Yes
Butylate	2008-41-5	2.2E+02	O	8.5E-05	3.5E-03	No	1	2.3E-02	5.8E-06	3.9E+02		7.7E-01	7.7E-01	4.5E+01	4.5E+04	4.9E-06	8.6E+04	3.9E+01	9.7E-01		1			5.4E-02		4.2E+00	1.0E+00	1.7E+00	3.1E-01	1		Yes
Butyl benzyl phthalate	85-68-7	3.1E+02	O	1.3E-06	5.2E-05	No	0	2.1E-02	5.2E-06	7.2E+03		1.4E+01	1.4E+01	2.7E+00	2.7E+03			3.9E+01	1.5E+01	0.1	1			3.9E-02		1.4E+01	9.0E-01	5.9E+00	2.6E-01	1		Yes
Butylphthalyl butylglycolate	85-70-1	3.4E+02	O	2.1E-08	8.4E-07	No	0	2.0E-02	4.9E-06	1.1E+04		2.2E+01	2.2E+01	8.8E+00	8.8E+03			2.0E+02	2.3E+01	0.1	1			1.2E-02		1.9E+01	9.0E-01	8.0E+00	8.2E-02	1		Yes
Cacodylic acid	75-60-5	1.4E+02	O	1.8E-14	7.4E-13	No	0	7.1E-02	8.3E-06	4.4E+01		8.8E-02	8.8E-02	2.0E+06	2.0E+09			3.8E+05	2.9E-01	0.1	1			4.6E-04		1.5E+00	1.0E+00	6.2E-01	2.1E-03	1		Yes
Cadmium and compounds +++	7440-43-9	1.1E+02	I			No	0				7.5E+01	7.5E+01	7.5E+01						7.5E+01	0.001	0.025	5	5		1.0E-03	1.1E+00	1.0E+00	4.5E-01	4.1E-03	1		
Camphechlor (Toxaphene)	8001-35-2	4.5E+02	O	6.0E-06	2.5E-04	No	0	3.2E-02	3.8E-06	7.7E+04		1.5E+02	1.5E+02	5.5E-01	5.5E+02			8.5E+01	1.5E+02	0.1	1	3	3	5.2E-02		8.2E+01	8.0E-01	3.4E+01	4.2E-01	1		No
Caprolactam	105-60-2	1.1E+02	O	2.5E-08	1.0E-06	No	0	6.9E-02	9.0E-06	2.5E+01		4.9E-02	4.9E-02	7.7E+05	7.7E+08			1.2E+05	2.5E-01	0.1	1			1.0E-03		1.1E+00	1.0E+00	4.5E-01	4.1E-03	1		Yes
Captafol	2425-06-1	3.5E+02	O	4.9E-09	2.0E-07	No	0	3.8E-02	4.5E-06	7.8E+02		1.6E+00	1.6E+00	1.4E+00	1.4E+03			2.3E+00	1.8E+00	0.1	1			5.8E-03		2.3E+01	9.0E-01	9.5E+00	4.1E-02	1		Yes
Captan	133-06-2	3.0E+02	O	7.0E-09	2.9E-07	No	0	2.6E-02	6.9E-06	2.5E+02		5.0E-01	5.0E-01	5.1E+00	5.1E+03			3.1E+00	7.0E-01	0.1	1			2.3E-03		1.2E+01	1.0E+00	5.1E+00	1.6E-02	1		Yes
Carbaryl	63-25-2	2.0E+02	O	3.3E-09	1.3E-07	No	0	2.7E-02	7.1E-06	3.5E+02		7.1E-01	7.1E-01	1.1E+02	1.1E+05			8.9E+01	9.1E-01	0.1	1			4.3E-03		3.4E+00	1.0E+00	1.4E+00	2.4E-02	1		Yes
Carbofuran	1563-66-2	2.2E+02	O	3.1E-09	1.3E-07	No	0	2.6E-02	6.6E-06	9.5E+01		1.9E-01	1.9E-01	3.2E+02	3.2E+05			9.3E+01	3.9E-01	0.1	1	40	40	3.1E-03		4.4E+00	1.0E+00	1.8E+00	1.8E-02	1		Yes
Carbon disulfide	75-15-0	7.6E+01	O	1.4E-02	5.9E-01	Yes	1	1.1E-01	1.3E-05	2.2E+01		4.3E-02	4.3E-02	2.2E+03	2.2E+06	1.3E-02	1.2E+03	5.5E+02	3.0E-01		1			1.1E-02		6.7E-01	1.0E+00	2.8E-01	3.8E-02	1		Yes
Carbon tetrachloride	56-23-5	1.5E+02	O	2.8E-02	1.1E+00	Yes	1	5.7E-02	9.8E-06	4.4E+01		8.8E-02	8.8E-02	7.9E+02	7.9E+05	8.6E-03	1.5E+03	3.2E+02	3.9E-01		1	5	5	1.6E-02		1.8E+00	1.0E+00	7.6E-01	7.8E-02	1		Yes
Carbosulfan	55285-14-8	3.8E+02	O	5.1E-07	2.1E-05	No	0	1.8E-02	4.4E-06	1.2E+04		2.4E+01	2.4E+01	3.0E-01	3.0E+02			7.2E+00	2.4E+01	0.1	1			5.8E-02		3.4E+01	8.0E-01	1.4E+01	4.3E-01	1		Yes
Carboxin	5234-68-4	2.4E+02	O	3.2E-10	1.3E-08	No	0	5.0E-02	5.8E-06	1.7E+02		3.4E-01	3.4E-01	1.5E+02	1.5E+05			6.5E+01	5.4E-01	0.1	1			2.0E-03		5.2E+00	1.0E+00	2.2E+00	1.2E-02	1		Yes
Chloramben	133-90-4	2.1E+02	O	3.9E-11	1.6E-09	No	0	5.4E-02	6.4E-06	2.1E+01		4.3E-02	4.3E-02	7.0E+02	7.0E+05			1.0E+02	2.4E-01	0.1	1			2.0E-03		3.6E+00	1.0E+00	1.5E+00	1.1E-02	1		Yes
Chloranil	118-75-2	2.5E+02	O	3.3E-10	1.3E-08	No	0	4.8E-02	5.7E-06	3.1E+02		6.2E-01	6.2E-01	2.5E+02	2.5E+05			1.8E+02	8.2E-01	0.1	1			1.9E-03		6.0E+00	1.0E+00	2.5E+00	1.2E-02	1		Yes
Chlordane	12789-03-6	4.1E+02	O	4.9E-05	2.0E-03	No	1	2.1E-02	5.4E-06	6.8E+04		1.4E+02	1.4E+02	5.6E-02	5.6E+01	1.7E-08	1.5E+06	7.6E+00	1.4E+02	0.04	1	2	2	1.1E-01		8.0E+01	7.0E-01	2.1E+01	8.3E-01	1		Yes
Chlordecone (Kepone)	143-50-0	4.9E+02	O	5.4E-08	2.2E-06	No	0	2.0E-02	4.9E-06	1.8E+04		3.5E+01	3.5E+01	2.7E+00	2.7E+03			9.5E+01	3.5E+01	0.1	1			1.1E-02		1.4E+02	8.0E-01	5.9E+01	9.3E-02	1		Yes
Chlorimuron-ethyl	90982-32-4	4.1E+02	O	1.8E-15	7.4E-14	No	0	3.4E-02	4.0E-06	7.2E+01		1.4E-01	1.4E-01	1.2E+03	1.2E+06			2.9E+02	3.4E-01	0.1	1			3.4E-04		5.3E+01	1.0E+00	2.2E+01	2.6E-03	1		Yes
Chlorine	7782-50-5	7.1E+01	I	1.2E-02	4.8E-01	Yes	1	1.5E-01	2.2E-05		2.5E-01	2.5E-01	2.5E-01	6.3E+03	6.3E+06	8.9E-03	1.2E+03	2.8E+03	4.9E-01		1				1.0E-03	6.3E-01	1.0E+00	2.6E-01	3.2E-03	1		Yes
Chlorine dioxide	10049-04-4	6.7E+01	I	4.0E-02	1.6E+00	Yes	1	1.6E-01	2.2E-05												1				1.0E-03	6.0E-01	1.0E+00	2.5E-01	3.2E-03	1		Yes
Chloroacetic acid	79-11-8	9.4E+01	O	9.3E-09	3.8E-07	No	0	9.4E-02	1.2E-05	1.4E+00		2.9E-03	2.9E-03	8.6E+05	8.6E+08			8.8E+04	2.0E-01	0.1	1		60	6.5E-04		8.5E-01	1.0E+00	3.6E-01	2.4E-03	1		Yes
2-Chloroacetophenone	532-27-4	1.5E+02	O	3.5E-06	1.4E-04	No	0	5.2E-02	8.7E-06	9.9E+01		2.0E-01	2.0E-01	1.1E+03	1.1E+06			3.3E+02	4.0E-01	0.1	1			4.1E-03		1.9E+00	1.0E+00	7.7E-01	1.9E-02	1		Yes
4-Chloroaniline	106-47-8	1.3E+02	O	1.2E-06	4.7E-05	No	0	7.0E-02	1.0E-05	1.1E+02		2.3E-01	2.3E-01	3.9E+03	3.9E+06			1.3E+03	4.3E-01	0.1	1			5.0E-03		1.3E+00	1.0E+00	5.4E-01	2.2E-02	1		Yes
Chlorobenzene	108-90-7	1.1E+02	O	3.1E-03	1.3E-01	Yes	1	7.2E-02	9.5E-06	2.3E+02		4.7E-01	4.7E-01	5.0E+02	5.0E+05	8.3E-04	6.4E+03	2.9E+02	6.8E-01		1	100	100	2.8E-02		1.1E+00	1.0E+00	4.5E-01	1.2E-01	1		Yes
Chlorobenzilate	510-15-6	3.3E+02	O	7.2E-08	3.0E-06	No	0	2.2E-02	5.5E-06	1.5E+03		3.1E+00	3.1E+00	1.3E+01	1.3E+04			4.1E+01	3.3E+00	0.1	1			3.3E-02		1.7E+01	8.0E-01	7.0E+00	2.3E-01	1		Yes
p-Chlorobenzoic acid	74-11-3	1.6E+02	O	8.0E-08	3.3E-06	No	0	5.5E-02	9.5E-06	2.7E+01		5.3E-02	5.3E-02	7.2E+01	7.2E+04			1.1E+01	2.5E-01	0.1	1			1.2E-02		1.9E+00	1.0E+00	7.9E-01	5.8E-02	1		Yes
4-Chlorobenzotrifluoride	98-56-6	1.8E+02	O	3.5E-02	1.4E+00	Yes	1	3.8E-02	8.0E-06	1.6E+03		3.2E+00	3.2E+00	2.9E+01	2.9E+04	8.1E-04	6.8E+03	1.0E+02	3.5E+00		1			3.8E-02		2.6E+00	1.0E+00	1.1E+00	1.9E-01	1		Yes
2-Chloro-1,3-butadiene	126-99-8	8.9E+01	O	5.6E-02	2.3E+00	Yes	1	8.4E-02	1.0E-05	6.1E+01		1.2E-01	1.2E-01	8.7E+02	8.7E+05	1.6E-02	1.1E+03	5.7E+02	5.3E-01		1			2.4E-02		7.9E-01	1.0E+00	3.3E-01	8.6E-02	1		Yes
1-Chlorobutane	109-69-3	9.3E+01	O	1.7E-02	6.8E-01	Yes	1	7.8E-02	9.3E-06	7.2E+01		1.4E-01	1.4E-01	1.1E+03	1.1E+06	7.6E-03	1.8E+03	4.1E+02	4.1E-01		1			2.7E-02		8.3E-01	1.0E+00	3.5E-01	1.0E-01	1		Yes
1-Chloro-1,1-difluoroethane	75-68-3	1.0E+02	O	5.9E-02	2.4E+00	Yes	1	8.0E-02	1.0E-05	4.4E+01		8.8E-02	8.8E-02	1.4E+03	1.4E+06	1.6E-02	1.0E+03	9.0E+02	5.0E-01		1			9.9E-03		9.2E-01	1.0E+00	3.8E-01	3.8E-02	1		Yes
Chlorodifluoromethane	75-45-6	8.6E+01	O	4.1E-02	1.7E+00	Yes	1	1.0E-01	1.3E-05	3.2E+01		6.4E-02	6.4E-02	2.8E+03	2.8E+06	1.9E-02	9.4E+02	1.3E+03	4.1E-01		1			2.7E-03		7.7E-01	1.0E+00	3.2E-01	9.6E-03	1		Yes
2-Chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester sulfurous acid (Aramite)	140-57-8	3.3E+02	O	1.9E-07	7.8E-06	No	0	2.0E-02	5.0E-06	5.6E+03		1.1E+01	1.1E+01	5.9E-01	5.9E+02			6.6E+00	1.1E+01	0.1	1			3.3E-02		1.9E+01	8.0E-01	7.9E+00	2.3E-01	1		Yes
Chloroform	67-66-3	1.2E+02	O	3.7E-03	1.5E-01	Yes	1	7.7E-02	1.1E-05	3.2E+01		6.4E-02	6.4E-02	8.0E+03	8.0E+06	3.2E-03	2.6E+03	1.5E+03	2.8E-01		1	100	80	6.8E-03		1.2E+00	1.0E+00	4.9E-01	2.9E-02	1		Yes
Chloromethane	74-87-3	5.0E+01	O	8.8E-03	3.6E-01	Yes	1	1.2E-01	1.4E-05	1.3E+01		2.6E-02	2.6E-02	5.3E+03	5.3E+06	1.2E-02	1.2E+03	1.0E+03	2.6E-01		1			3.3E-03		4.8E-01	1.0E+00	2.0E-01	9.0E-03	1		Yes
4-Chloro-2-methylaniline hydrochloride	3165-93-3	1.8E+02	O	1.6E-06	6.4E-05	No	0	6.0E-02	7.0E-06	3.5E+02		7.0E-01	7.0E-01	9.5E+02	9.5E+05			7.7E+02	9.0E-01	0.1	1			1.8E-05		2.5E+00	1.0E+00	1.0E+00	9.2E-05	1		Yes
beta-Chloronaphthalene	91-58-7	1.6E+02	O	3.2E-04	1.3E-02	No	1	4.5E-02	7.7E-06	2.5E+03		5.0E+00	5.0E+00	1.2E+01	1.2E+04	6.2E-06	8.0E+04	5.9E+01	5.2E+00	0.13	1			7.5E-02		2.1E+00	1.0E+00	8.6E-01	3.7E-01	1		Yes
o-Chloronitrobenzene	88-73-3	1.6E+02	O	9.3E-06	3.8E-04	No	0	5.1E-02	8.8E-06	3.7E+02		7.4E-01	7.4E-01	4.4E+02	4.4E+05			3.7E+02	9.4E-01	0.1	1			6.3E-03		1.9E+00	1.0E+00	8.0E-01	3.0E-02	1		Yes
p-Chloronitrobenzene	100-00-5	1.6E+02	O	4.9E-06	2.0E-04	No	0	5.0E-02	8.5E-06	3.6E+02		7.3E-01	7.3E-01	2.3E+02	2.3E+05			1.9E+02	9.3E-01	0.1	1			7.9E-03		1.9E+00	1.0E+00	8.0E-01	3.8E-02	1		Yes
2-Chlorophenol	95-57-8	1.3E+02	O	1.1E-05	4.6E-04	Yes	1	6.6E-02	9.5E-06	3.9E+02		7.8E-01	7.8E-01	1.1E+04	1.1E+07	1.9E-06	1.4E+05	9.9E+03	9.8E-01		1			8.0E-03		1.3E+00	1.0E+00	5.5E-01	3.5E-02	1		Yes
Chlorothalonil	1897-45-6	2.7E+02	O	2.0E-06	8.2E-05	No	0	2.8E-02	7.3E-06	1.0E+03		2.1E+00	2.1E+00	8.1E-01	8.1E+02			1.8E+00	2.3E+00	0.1	1			5.4E-03		7.8E+00	9.0E-01	3.2E+00	3.4E-02	1		Yes
o-Chlorotoluene	95-49-8	1.3E+02	O	3.6E-03	1.5E-01	Yes	1	6.3E-02	8.7E-06	3.8E+02		7.7E-01	7.7E-01	3.7E+02	3.7E+05	5.5E-04	8.1E+03	3.3E+02	9.8E-01		1			5.7E-02		1.3E+00	1.0E+00	5.4E-01	2.5E-01	1		Yes
Chlorpropham	101-21-3	2.1E+02	O	5.7E-07	2.3E-05	No	0	2.6E-02	6.7E-06	3.5E+02		7.0E-01	7.0E-01	8.9E+01	8.9E+04			7.1E+01	9.0E-01	0.1	1			2.1E-02		4.0E+00	9.0E-01	1.7E+00	1.2E-01	1		Yes
Chlorpyrifos	2921-88-2	3.5E+02	O	2.9E-06	1.2E-04	No	0	3.8E-02	4.5E-06	7.3E+03		1.5E+01	1.5E+01	1.1E+00	1.1E+03			1.6E+01	1.5E+01	0.1	1			3.3E-02		2.3E+01	8.0E-01	9.7E+00	2.4E-01	1		Yes
Chlorpyrifos-methyl	5598-13-0	3.2E+02	O	3.8E-06	1.5E-04	No	0	4.0E-02	4.7E-06	2.2E+03		4.4E+00	4.4E+00	4.8E+00	4.8E+03			2.1E+01	4.6E+00	0.1	1			1.8E-02		1.6E+01	9.0E-01	6.7E+00	1.2E-01	1		Yes
Chlorsulfuron	64902-72-3	3.6E+02	O	3.4E-16	1.4E-14	No	0	3.8E-02	4.4E-06	3.2E+02		6.4E-01	6.4E-01	3.1E+04	3.1E+07			2.3E+04	8.4E-01	0.1	1			3.3E-04		2.5E+01	1.0E+00	1.1E+01	2.4E-03	1		Yes
Chlorthiophos	60238-56-4	3.6E+02	O	1.2E-06	4.9E-05	No	0	3.7E-02	4.4E-06	1.3E+04		2.6E+01	2.6E+01	3.0E-01	3.0E+02			7.7E+00	2.6E+01	0.1	1			1.1E-01		4.3E+01	8.0E-01	1.1E+01	7.7E-01	1		Yes
Chromium, Total	7440-47-3	5.2E+01	I			No	0				1.8E+06	1.8E+06	1.8E+06						1.8E+06		0.013	100	100		1.0E-03	4.9E-01	1.0E+00	2.1E-01	2.8E-03	1		Yes
Chromium III *	16065-83-1	5.2E+01	I			No	0				1.8E+06	1.8E+06	1.8E+06						1.8E+06		0.013				1.0E-03	4.9E-01	1.0E+00	2.1E-01	2.8E-03	1		Yes
Chromium VI +++	18540-29-9	5.2E+01	I			No	0				1.9E+01	1.9E+01	1.9E+01	1.7E+06	1.7E+09				1.9E+01		0.025				2.0E-03	4.9E-01	1.0E+00	2.1E-01	5.5E-03	1	M	Yes
Clofentezine (Apollo)	74115-24-5	3.0E+02	O	3.9E-10	1.6E-08	No	0	4.2E-02	4.9E-06	3.0E+04		6.0E+01	6.0E+01	1.0E+00	1.0E+03			6.1E+01	6.1E+01	0.1	1			3.6E-03		1.3E+01	9.0E-01	5.2E+00	2.4E-02	1		Yes
Cobalt	7440-48-4	5.9E+01	I			No	0				4.5E+01	4.5E+01	4.5E+01						4.5E+01		1				4.0E-04	5.4E-01	1.0E+00	2.2E-01	1.2E-03	1		Yes
Coke Oven Emissions	8007-45-2		O	1.1E-02	4.5E-01	Yes	1	1.0E-01	1.2E-05	1.6E+04		3.2E+01	3.2E+01			7.7E-05			3.2E+01		1						0.0E+00			1	M	
Copper and compounds	7440-50-8	6.4E+01	I			No	0				3.5E+01	3.5E+01	3.5E+01						3.5E+01		1	1300	1300		1.0E-03	5.7E-01	1.0E+00	2.4E-01	3.1E-03	1		Yes
Crotonaldehyde	123-73-9	7.0E+01	O	1.9E-05	7.9E-04	Yes	1	9.6E-02	1.1E-05	1.8E+00		3.6E-03	3.6E-03	1.5E+05	1.5E+08	4.0E-05	1.9E+04	1.6E+04	2.0E-01		1			1.6E-03		6.2E-01	1.0E+00	2.6E-01	5.1E-03	1		Yes
Cumene (Isopropylbenzene)	98-82-8	1.2E+02	O	1.2E-02	4.7E-01	Yes	1	6.0E-02	7.9E-06	7.0E+02		1.4E+00	1.4E+00	6.1E+01	6.1E+04	9.5E-04	6.2E+03	9.7E+01	1.6E+00		1			9.0E-02		1.2E+00	1.0E+00	5.0E-01	3.8E-01	1		Yes
Cyanazine	21725-46-2	2.4E+02	O	2.6E-12	1.1E-10	No	0	4.9E-02	5.7E-06	1.3E+02		2.7E-01	2.7E-01	1.7E+02	1.7E+05			6.3E+01	4.7E-01	0.1	1			2.1E-03		5.6E+00	1.0E+00	2.3E+00	1.2E-02	1		Yes
Cyanide (free)	57-12-5	2.6E+01	I	1.0E-04	4.2E-03	Yes	1	2.1E-01	2.5E-05		9.9E+00	9.9E+00	9.9E+00	9.5E+04	9.5E+07	4.7E-06	5.3E+04	9.5E+05	1.0E+01		1	200	200		1.0E-03	3.5E-01	1.0E+00	1.5E-01	2.0E-03	1		Yes
Cyanide (hydrogen)	74-90-8	2.7E+01	I	1.3E-04	5.4E-03	Yes	1	1.7E-01	1.7E-05		9.9E+00	9.9E+00	9.9E+00	1.0E+06	1.0E+09	4.9E-06	5.2E+04	1.0E+07	1.0E+01		1				1.0E-03	3.6E-01	1.0E+00	1.5E-01	2.0E-03	1		Yes
Cyanogen	460-19-5	5.2E+01	I	5.4E-03	2.2E-01	Yes	1	1.2E-01	1.4E-05					8.0E+03	8.0E+06						1				8.9E-04	4.9E-01	1.0E+00	2.1E-01	2.5E-03	1		Yes

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-2: CHEMICAL-SPECIFIC PARAMETERS

Contaminant	CAS	MW (g/mol)	Organic/ Inorganic	Henry's Law Constant H_units (atm-m³/mol)	Henry's Law Constant H' (H_unitless) (unitless)	VP>1?	VOL	D_i (cm²/s)	D_w (cm²/s)	K_{oc} (organics) (cm³/g)	K_d (inorganics) (cm³/g)	$K_{d\ VF}$ (cm³/g)	K_d_s_to_gw (cm³/g)	S (mg/L-water)	S (µg/L-water)	D_A (cm²/s)	VF (m³/kg)	SAT (mg/kg)	soil-to-gw factor (kg/L)	ABS_d	ABS_{GI}	Title 118 MCL (µg/L)	EPA Fed MCL MCL (µg/L)	Kp.org (cm/hr)	Kp.inorg (cm/hr)	t_star (hr)	FA (unitless)	tau_event (hr)	B (unitless)	RBA (unitless)	Mutagen	In EPD?
Cyanogen bromide	506-68-3	1.1E+02	I	2.5E-02	1.0E+00	Yes	1	9.8E-02	1.4E-05												1				2.6E-04	9.9E-01	1.0E+00	4.1E-01	1.0E-03	1		Yes
Cyanogen chloride	506-77-4	6.1E+01	I	1.9E-03	7.9E-02	Yes	1	1.2E-01	1.4E-05					6.0E+04	6.0E+07						1				3.9E-04	5.6E-01	1.0E+00	2.3E-01	1.2E-03	1		Yes
Cyclohexane	110-82-7	8.4E+01	O	1.5E-01	6.1E+00	Yes	1	8.0E-02	9.1E-06	1.5E+02		2.9E-01	2.9E-01	5.5E+01	5.5E+04	1.7E-02	1.0E+03	8.5E+01	1.0E+00		1			1.0E-01		7.5E-01	1.0E+00	3.1E-01	3.6E-01	1		Yes
Cyclohexanone	108-94-1	9.8E+01	O	9.0E-06	3.7E-04	Yes	1	7.7E-02	9.4E-06	1.7E+01		3.5E-02	3.5E-02	2.5E+04	2.5E+07	1.2E-05	4.2E+04	3.4E+03	2.3E-01		1			1.5E-03		8.9E-01	1.0E+00	3.7E-01	5.8E-03	1		Yes
Cyclohexylamine	108-91-8	9.9E+01	O	4.2E-06	1.7E-04	Yes	1	7.1E-02	8.5E-06	3.2E+01		6.4E-02	6.4E-02	1.0E+06	1.0E+09	4.3E-06	7.5E+04	1.6E+05	2.6E-01		1			4.3E-03		9.1E-01	1.0E+00	3.8E-01	1.6E-02	1		Yes
Cyfluthrin (Baythroid)	68359-37-5	4.3E+02	O	2.9E-08	1.2E-06	No	0	3.3E-02	3.9E-06	1.3E+05		2.6E+02	2.6E+02	3.0E-03	3.0E+00			7.8E-01	2.6E+02	0.1	1			5.2E-02		6.8E+01	7.0E-01	2.8E+01	4.1E-01	1		Yes
Cyhalothrin (Karate)	68085-85-8	4.5E+02	O	1.5E-06	6.1E-05	No	0	3.2E-02	3.8E-06	3.4E+05		6.8E+02	6.8E+02	5.0E-03	5.0E+00			3.4E+00	6.8E+02	0.1	1			2.1E-01		1.4E+02	5.0E-01	3.5E+01	1.7E+00	1		No
Cyromazine	66215-27-8	1.7E+02	O	5.7E-14	2.3E-12	No	0	6.3E-02	7.3E-06	2.9E+01		5.7E-02	5.7E-02	1.3E+04	1.3E+07			2.0E+03	2.6E-01	0.1	1			8.0E-04		2.2E+00	1.0E+00	9.0E-01	4.0E-03	1		Yes
Dacthal	1861-32-1	3.3E+02	O	2.2E-06	8.9E-05	No	0	4.0E-02	4.6E-06	5.1E+02		1.0E+00	1.0E+00	5.0E-01	5.0E+02			5.6E-01	1.2E+00	0.1	1			1.5E-02		1.8E+01	9.0E-01	7.6E+00	1.1E-01	1		Yes
Dalapon	75-99-0	1.4E+02	O	5.7E-08	2.3E-06	No	0	6.0E-02	9.4E-06	3.2E+00		6.5E-03	6.5E-03	5.0E+05	5.0E+08			5.3E+04	2.1E-01	0.1	1	200	200	8.2E-04		1.6E+00	1.0E+00	6.6E-01	3.7E-03	1		Yes
Daminozide (Alar)	1596-84-5	1.6E+02	O	4.2E-10	1.7E-08	No	0	6.4E-02	7.5E-06	1.0E+01		2.0E-02	2.0E-02	1.0E+05	1.0E+08			1.2E+04	2.2E-01	0.1	1			2.0E-05		2.0E+00	1.0E+00	8.3E-01	9.7E-05	1		Yes
Demeton	8065-48-3	5.2E+02	O	3.8E-06	1.6E-04	No	0	1.6E-02	3.8E-06					6.7E+02	6.7E+05					0.1	1			7.6E-03		2.0E+02	8.0E-01	8.2E+01	6.6E-02	1		Yes
Diallate	2303-16-4	2.7E+02	O	3.8E-06	1.6E-04	No	0	4.5E-02	5.3E-06	6.4E+02		1.3E+00	1.3E+00	1.4E+01	1.4E+04			1.9E+01	1.5E+00	0.1	1			4.6E-02		8.2E+00	9.0E-01	3.4E+00	2.9E-01	1		Yes
Diazinon	333-41-5	3.0E+02	O	1.1E-07	4.6E-06	No	0	2.1E-02	5.2E-06	3.0E+03		6.1E+00	6.1E+00	4.0E+01	4.0E+04			2.5E+02	6.3E+00	0.1	1			1.0E-02		1.3E+01	9.0E-01	5.3E+00	7.0E-02	1		Yes
Dibenzofuran	132-64-9	1.7E+02	O	2.1E-04	8.7E-03	No	1	6.5E-02	7.4E-06	9.2E+03		1.8E+01	1.8E+01	3.1E+00	3.1E+03	1.6E-06	1.6E+05	5.7E+01	1.9E+01	0.03	1			9.8E-02		2.2E+00	1.0E+00	9.2E-01	4.9E-01	1		Yes
1,4-Dibromobenzene	106-37-6	2.4E+02	O	8.9E-04	3.7E-02	No	1	3.3E-02	9.3E-06	3.8E+02		7.5E-01	7.5E-01	2.0E+01	2.0E+04	7.6E-05	2.2E+04	1.7E+01	9.5E-01		1			2.5E-02		5.3E+00	9.0E-01	2.2E+00	1.4E-01	1		Yes
Dibromochloromethane	124-48-1	2.1E+02	O	7.8E-04	3.2E-02	Yes	1	3.7E-02	1.1E-05	3.2E+01		6.4E-02	6.4E-02	2.7E+03	2.7E+06	3.7E-04	7.9E+03	4.6E+02	2.7E-01		1	100	80	2.9E-03		3.7E+00	1.0E+00	1.5E+00	1.6E-02	1		Yes
1,2-Dibromo-3-chloropropane	96-12-8	2.4E+02	O	1.5E-04	6.0E-03	No	1	3.2E-02	8.9E-06	1.2E+02		2.3E-01	2.3E-01	1.2E+03	1.2E+06	3.1E-05	3.2E+04	4.1E+02	4.3E-01		1	0.2	0.2	6.9E-03		5.3E+00	1.0E+00	2.2E+00	4.1E-02	1	M	Yes
1,2-Dibromoethane	106-93-4	1.9E+02	O	6.5E-04	2.7E-02	Yes	1	4.3E-02	1.0E-05	4.0E+01		7.9E-02	7.9E-02	3.9E+03	3.9E+06	3.3E-04	8.6E+03	7.2E+02	2.8E-01		1	0.05	0.05	2.8E-03		2.8E+00	1.0E+00	1.2E+00	1.5E-02	1		Yes
Dibutyl phthalate	84-74-2	2.8E+02	O	1.8E-06	7.4E-05	No	0	2.1E-02	5.3E-06	1.2E+03		2.3E+00	2.3E+00	1.1E+01	1.1E+04			2.7E+01	2.5E+00	0.1	1			4.2E-02		9.1E+00	9.0E-01	3.8E+00	2.7E-01	1		Yes
Dicamba	1918-00-9	2.2E+02	O	2.2E-09	8.9E-08	No	0	2.9E-02	7.8E-06	2.9E+01		5.8E-02	5.8E-02	8.3E+03	8.3E+06			1.3E+03	2.6E-01	0.1	1			2.7E-03		4.4E+00	1.0E+00	1.8E+00	1.5E-02	1		Yes
1,2-Dichlorobenzene	95-50-1	1.5E+02	O	1.9E-03	7.8E-02	Yes	1	5.6E-02	8.9E-06	3.8E+02		7.7E-01	7.7E-01	1.6E+02	1.6E+05	2.7E-04	1.2E+04	1.4E+02	9.7E-01		1	600	600	4.5E-02		1.7E+00	1.0E+00	7.0E-01	2.1E-01	1		Yes
1,4-Dichlorobenzene	106-46-7	1.5E+02	O	2.4E-03	9.9E-02	Yes	1	5.5E-02	8.7E-06	3.8E+02		7.5E-01	7.5E-01	8.1E+01	8.1E+04	3.3E-04	1.0E+04	7.1E+01	9.6E-01		1	75	75	4.5E-02		1.7E+00	1.0E+00	7.0E-01	2.1E-01	1		Yes
3,3-Dichlorobenzidine	91-94-1	2.5E+02	O	2.8E-11	1.2E-09	No	0	4.7E-02	5.5E-06	3.2E+03		6.4E+00	6.4E+00	3.1E+00	3.1E+03			2.0E+01	6.6E+00	0.1	1			1.3E-02		6.6E+00	1.0E+00	2.8E+00	7.8E-02	1		Yes
4,4'-Dichlorobenzophenone	90-98-2	2.5E+02	O	1.1E-06	4.4E-05	No	0	2.6E-02	6.9E-06	2.9E+03		5.9E+00	5.9E+00	8.3E-01	8.3E+02			4.9E+00	6.1E+00	0.1	1			5.4E-02		6.4E+00	9.0E-01	2.7E+00	3.3E-01	1		Yes
1,4-Dichloro-2-butene	764-41-0	1.3E+02	O	8.5E-03	3.5E-01	Yes	1	6.7E-02	9.3E-06	1.3E+02		2.6E-01	2.6E-01	5.8E+02	5.8E+05	2.9E-03	3.2E+03	2.5E+02	4.9E-01		1			1.7E-02		1.3E+00	1.0E+00	5.3E-01	7.1E-02	1		Yes
Dichlorodifluoromethane	75-71-8	1.2E+02	O	3.4E-01	1.4E+01	Yes	1	7.6E-02	1.1E-05	4.4E+01		8.8E-02	8.8E-02	2.8E+02	2.8E+05	2.0E-02	8.4E+02	8.0E+02	1.5E+00		1			9.0E-03		1.2E+00	1.0E+00	5.0E-01	3.8E-02	1		Yes
p,p'-Dichlorodiphenyldichloroethane (DDD)	72-54-8	3.2E+02	O	6.6E-06	2.7E-04	No	0	4.1E-02	4.7E-06	1.2E+05		2.4E+02	2.4E+02	9.0E-02	9.0E+01			2.1E+01	2.4E+02	0.1	1			2.5E-01		2.6E+01	8.0E-01	6.5E+00	1.7E+00	1		Yes
p,p'-Dichlorodiphenyldichloroethylene (DDE)	72-55-9	3.2E+02	O	4.2E-05	1.7E-03	No	1	2.3E-02	5.9E-06	1.2E+05		2.4E+02	2.4E+02	4.0E-02	4.0E+01	9.0E-09	2.1E+06	9.4E+00	2.4E+02		1			5.5E-01		2.7E+01	8.0E-01	6.4E+00	3.7E+00	1		No
p,p'-Dichlorodiphenyltrichloroethane (DDT)	50-29-3	3.5E+02	O	8.3E-06	3.4E-04	No	0	3.8E-02	4.4E-06	1.7E+05		3.4E+02	3.4E+02	5.5E-03	5.5E+00			1.9E+00	3.4E+02	0.03	1			6.3E-01		4.4E+01	7.0E-01	1.0E+01	4.5E+00	1		No
1,1-Dichloroethane	75-34-3	9.9E+01	O	5.6E-03	2.3E-01	Yes	1	8.4E-02	1.1E-05	3.2E+01		6.4E-02	6.4E-02	5.0E+03	5.0E+06	4.9E-03	2.1E+03	1.0E+03	2.8E-01		1			6.8E-03		9.0E-01	1.0E+00	3.8E-01	2.6E-02	1		Yes
1,2-Dichloroethane	107-06-2	9.9E+01	O	1.2E-03	4.8E-02	Yes	1	8.6E-02	1.1E-05	4.0E+01		7.9E-02	7.9E-02	8.6E+03	8.6E+06	1.2E-03	4.6E+03	1.6E+03	2.8E-01		1	5	5	4.2E-03		9.0E-01	1.0E+00	3.8E-01	1.6E-02	1		Yes
1,1-Dichloroethylene	75-35-4	9.7E+01	O	2.6E-02	1.1E+00	Yes	1	8.6E-02	1.1E-05	3.2E+01		6.4E-02	6.4E-02	2.4E+03	2.4E+06	1.3E-02	1.2E+03	8.8E+02	3.6E-01		1	7	7	1.2E-02		8.8E-01	1.0E+00	3.7E-01	4.4E-02	1		Yes
1,2-Dichloroethylene (cis)	156-59-2	9.7E+01	O	4.1E-03	1.7E-01	Yes	1	8.8E-02	1.1E-05	4.0E+01		7.9E-02	7.9E-02	6.4E+03	6.4E+06	3.7E-03	2.5E+03	1.4E+03	2.9E-01		1	70	70	1.1E-02		8.8E-01	1.0E+00	3.7E-01	4.2E-02	1		Yes
1,2-Dichloroethylene (trans)	156-60-5	9.7E+01	O	9.4E-03	3.8E-01	Yes	1	8.8E-02	1.1E-05	4.0E+01		7.9E-02	7.9E-02	4.5E+03	4.5E+06	7.1E-03	1.7E+03	1.1E+03	3.1E-01		1	100	100	1.1E-02		8.8E-01	1.0E+00	3.7E-01	4.2E-02	1		Yes
2,4-Dichlorophenol	120-83-2	1.6E+02	O	4.3E-06	1.8E-04	No	0	4.9E-02	8.7E-06	1.5E+02		2.9E-01	2.9E-01	5.6E+03	5.6E+06			2.2E+03	4.9E-01	0.1	1			2.1E-02		2.1E+00	1.0E+00	8.6E-01	1.0E-01	1		Yes
2,4-Dichlorophenoxy acetic acid (2,4-D)	94-75-7	2.2E+02	O	3.5E-08	1.4E-06	No	0	2.8E-02	7.3E-06	3.0E+01		5.9E-02	5.9E-02	6.8E+02	6.8E+05			1.1E+02	2.6E-01	0.05	1	70	70	6.6E-03		4.4E+00	1.0E+00	1.8E+00	3.8E-02	1		Yes
2,4-Dichlorophenoxy butyric acid (2,4-DB)	94-82-6	2.5E+02	O	2.3E-09	9.4E-08	No	0	2.6E-02	6.7E-06	3.7E+02		7.4E-01	7.4E-01	4.6E+01	4.6E+04			3.9E+01	9.4E-01	0.1	1			1.4E-02		6.3E+00	9.0E-01	2.6E+00	8.4E-02	1		Yes
Decabromodiphenyl ether (BDE-209)	1163-19-5	9.6E+02	O	1.2E-08	4.9E-07	No	0	1.9E-02	4.8E-06	2.8E+05		5.5E+02	5.5E+02	1.0E-04	1.0E-01			5.5E-02	5.5E+02	0.1	1			7.3E-01		1.1E+05	0.0E+00	2.5E+04	8.6E+00	1		No
1,2-Dichloropropane	78-87-5	1.1E+02	O	2.8E-03	1.2E-01	Yes	1	7.3E-02	9.7E-06	6.1E+01		1.2E-01	1.2E-01	2.8E+03	2.8E+06	1.9E-03	3.8E+03	6.8E+02	3.3E-01		1	5	5	7.5E-03		1.1E+00	1.0E+00	4.5E-01	3.1E-02	1		Yes
2,3-Dichloropropanol	616-23-9	1.3E+02	O	3.6E-09	1.5E-07	No	0	6.8E-02	9.9E-06	5.6E+00		1.1E-02	1.1E-02	6.4E+04	6.4E+07			7.1E+03	2.1E-01	0.1	1			9.8E-04		1.3E+00	1.0E+00	5.5E-01	4.3E-03	1		Yes
1,3-Dichloropropene	542-75-6	1.1E+02	O	3.6E-03	1.5E-01	Yes	1	7.6E-02	1.0E-05	7.2E+01		1.4E-01	1.4E-01	2.8E+03	2.8E+06	2.2E-03	3.6E+03	7.6E+02	3.6E-01		1			8.3E-03		1.1E+00	1.0E+00	4.4E-01	3.4E-02	1		Yes
Dichlorvos	62-73-7	2.2E+02	O	5.7E-07	2.4E-05	No	0	2.8E-02	7.3E-06	5.4E+01		1.1E-01	1.1E-01	8.0E+03	8.0E+06			1.7E+03	3.1E-01	0.1	1			8.0E-04		4.4E+00	1.0E+00	1.8E+00	4.6E-03	1		Yes
Dicrotophos (Bidrin)	141-66-2	2.4E+02	O	5.0E-11	2.1E-09	No	0	2.5E-02	6.4E-06	1.7E+01		3.3E-02	3.3E-02	1.0E+06	1.0E+09			1.3E+05	2.3E-01	0.1	1			7.3E-05		5.4E+00	1.0E+00	2.2E+00	4.3E-04	1		Yes
Dicyclopentadiene	77-73-6	1.3E+02	O	6.3E-02	2.6E+00	Yes	1	5.6E-02	7.8E-06	1.5E+03		3.0E+00	3.0E+00	2.6E+01	2.6E+04	2.1E-03	4.1E+03	9.6E+01	3.5E+00		1			3.6E-02		1.4E+00	1.0E+00	5.8E-01	1.6E-01	1		Yes
Dieldrin	60-57-1	3.8E+02	O	1.0E-05	4.1E-04	No	0	2.3E-02	6.0E-06	2.0E+04		4.0E+01	4.0E+01	2.0E-01	2.0E+02			7.9E+00	4.0E+01	0.1	1			3.3E-02		3.4E+01	8.0E-01	1.4E+01	2.4E-01	1		Yes
Diethylene glycol, monobutyl ether	112-34-5	1.6E+02	O	7.2E-09	2.9E-07	No	0	4.1E-02	7.0E-06	1.0E+01		2.0E-02	2.0E-02	1.0E+06	1.0E+09			1.2E+05	2.2E-01	0.1	1			4.5E-04		2.0E+00	1.0E+00	8.5E-01	2.2E-03	1		Yes
Diethylene glycol, monoethyl ether	111-90-0	1.3E+02	O	2.2E-08	9.1E-07	No	0	5.6E-02	8.0E-06	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09			1.0E+05	2.0E-01	0.1	1			1.2E-04		1.4E+00	1.0E+00	5.9E-01	5.4E-04	1		Yes
Diethylformamide	617-84-5	1.0E+02	O	1.3E-07	5.3E-06	Yes	1	7.3E-02	9.0E-06	2.1E+00		4.1E-03	4.1E-03	1.0E+06	1.0E+09	7.5E-07	1.4E+05	1.0E+05	2.0E-01		1			4.6E-04		9.3E-01	1.0E+00	3.9E-01	1.8E-03	1		Yes
Di(2-ethylhexyl)adipate	103-23-1	3.7E+02	O	4.3E-07	1.8E-05	No	0	1.7E-02	4.2E-06	3.6E+04		7.2E+01	7.2E+01	7.8E-01	7.8E+02			5.6E+01	7.2E+01	0.1	1	400	400	3.2E+00		5.8E+01	0.0E+00	1.3E+01	2.4E+01	1		Yes
Diethyl phthalate	84-66-2	2.2E+02	O	6.1E-07	2.5E-05	No	0	2.6E-02	6.7E-06	1.0E+02		2.1E-01	2.1E-01	1.1E+03	1.1E+06			3.3E+02	4.1E-01	0.1	1			3.6E-03		4.4E+00	1.0E+00	1.8E+00	2.1E-02	1		Yes
Diethylstilbestrol	56-53-1	2.7E+02	O	5.8E-12	2.4E-10	No	0	4.6E-02	5.3E-06	2.7E+05		5.5E+02	5.5E+02	1.2E+01	1.2E+04			6.6E+03	5.5E+02	0.1	1			1.1E-01		1.3E+01	9.0E-01	3.3E+00	7.2E-01	1		Yes
Difenzoquat (Avenge)	43222-48-6	3.6E+02	O			No	0	3.8E-02	4.4E-06	7.8E+04		1.6E+02	1.6E+02	8.2E+05	8.2E+08				1.6E+02	0.1	1			4.0E-05		2.6E+01	1.0E+00	1.1E+01	2.9E-04	1		Yes
Diflubenzuron	35367-38-5	3.1E+02	O	4.6E-09	1.9E-07	No	0	4.1E-02	4.8E-06	4.6E+02		9.3E-01	9.3E-01	8.0E-02	8.0E+01			8.2E-02	1.1E+00	0.1	1			1.1E-02		1.4E+01	9.0E-01	5.8E+00	7.3E-02	1		Yes
1,1-Difluoroethane	75-37-6	6.6E+01	O	2.0E-02	8.3E-01	Yes	1	1.0E-01	1.2E-05	3.2E+01		6.4E-02	6.4E-02	3.2E+03	3.2E+06	1.4E-02	1.1E+03	1.0E+03	3.4E-01		1			2.1E-03		5.9E-01	1.0E+00	2.5E-01	6.6E-03	1		Yes
Diisopropyl methylphosphonate (DIMP)	1445-75-6	1.8E+02	O	4.4E-05	1.8E-03	No	1	3.4E-02	6.6E-06	4.2E+01		8.4E-02	8.4E-02	1.5E+03	1.5E+06	1.8E-05	3.8E+04	2.8E+02	2.8E-01		1			7.4E-04		2.6E+00	1.0E+00	1.1E+00	3.8E-03	1		Yes
Dimethipin	55290-64-7	2.1E+02	O	2.3E-11	9.4E-10	No	0	5.4E-02	6.3E-06	1.0E+01		2.0E-02	2.0E-02	4.6E+03	4.6E+06			5.5E+02	2.2E-01	0.1	1			8.0E-05		3.8E+00	1.0E+00	1.6E+00	4.5E-04	1		Yes
Dimethoate	60-51-5	2.3E+02	O	2.4E-10	9.9E-09	No	0	2.6E-02	6.7E-06	1.3E+01		2.6E-02	2.6E-02	2.3E+04	2.3E+07			2.9E+03	2.3E-01	0.1	1			2.7E-04		4.9E+00	1.0E+00	2.0E+00	1.6E-03	1		Yes
3,3'-Dimethoxybenzidine	119-90-4	2.4E+02	O	4.7E-11	1.9E-09	No	0	4.9E-02	5.7E-06	5.1E+02		1.0E+00	1.0E+00	6.0E+01	6.0E+04			6.7E+01	1.2E+00	0.1	1			1.1E-03		5.9E+00	1.0E+00	2.5E+00	6.4E-03	1		Yes
N-N-Dimethylaniline	121-69-7	1.2E+02	O	5.7E-05	2.3E-03	No	1	6.3E-02	8.3E-06	7.9E+01		1.6E-01	1.6E-01	1.5E+03	1.5E+06	3.0E-05	3.1E+04	3.7E+02	3.6E-01		1			1.1E-02		1.2E+00	1.0E+00	5.0E-01	4.7E-02	1		Yes
2,4-Dimethylaniline	95-68-1	1.2E+02	O	2.5E-06	1.0E-04	No	0	6.3E-02	8.4E-06	1.8E+02		3.7E-01	3.7E-01	6.1E+03	6.1E+06			2.8E+03	5.7E-01	0.1	1			4.3E-03		1.2E+00	1.0E+00	5.0E-01	1.8E-02	1		Yes
2,4-Dimethylaniline hydrochloride	21436-96-4	1.2E+02	O	2.3E-06	9.5E-05	No	0	7.8E-02	9.1E-06	3.5E+02		7.0E-01	7.0E-01	3.7E+03	3.7E+06			2.9E+03	9.0E-01	0.1	1			2.0E-05		1.2E+00	1.0E+00	5.0E-01	8.6E-05	1		Yes
3,3'-Dimethylbenzidine	119-93-7	2.1E+02	O	6.3E-11	2.6E-09	No	0	5.3E-02	6.2E-06	3.2E+03		6.4E+00	6.4E+00	1.3E+03	1.3E+06			8.4E+03	6.6E+00	0.1	1			3.6E-03		3.9E+00	1.0E+00	1.6E+00	2.0E-02	1		Yes
N,N-Dimethylformamide	68-12-2	7.3E+01	O	7.4E-08	3.0E-06	Yes	1	9.7E-02	1.1E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09	8.5E-07	1.3E+05	1.0E+05	2.0E-01		1			1.3E-04		6.5E-01	1.0E+00	2.7E-01	4.3E-04	1		Yes
2,4-Dimethylphenol	105-67-9	1.2E+02	O	9.5E-07	3.9E-05	No	0	6.2E-02	8.3E-06	4.9E+02		9.8E-01	9.8E-01	7.9E+03	7.9E+06			8.5E+03	1.2E+00	0.1	1			1.1E-02		1.2E+00	1.0E+00	5.1E-01	4.6E-02	1		Yes
2,6-Dimethylphenol	576-26-1	1.2E+02	O	6.7E-06	2.7E-04	No	0	7.7E-02	9.0E-06	5.0E+02		1.0E+00	1.0E+00	6.1E+03	6.1E+06			6.7E+03	1.2E+00	0.1	1			1.2E-02		1.2E+00	1.0E+00	5.1E-01	5.1E-02	1		Yes
3,4-Dimethylphenol	95-65-8	1.2E+02	O	4.2E-07	1.7E-05	No	0	6.3E-02	8.4E-06	4.9E+02		9.8E-01	9.8E-01	4.8E+03	4.8E+06			5.2E+03	1.2E+00	0.1	1			9.8E-03		1.2E+00	1.0E+00	5.1E-01	4.2E-02	1		Yes
Dimethyl terephthalate	120-61-6	1.9E+02	O	1.3E-04	5.5E-03	No	1	2.9E-02	6.7E-06	3.1E+01		6.2E-02	6.2E-02	1.9E+01	1.9E+04	5.1E-05	2.1E+04	3.1E+00	2.6E-01		1			4.0E-03		3.1E+00	1.0E+00	1.3E+00	2.1E-02	1		Yes
4,6-Dinitro-o-cyclohexyl phenol	131-89-5	2.7E+02	O	5.5E-08	2.3E-06	No	0	4.6E-02	5.4E-06	1.7E+04		3.3E+01	3.3E+01	1.5E+01	1.5E+04			5.0E+02	3.3E+01	0.1	1			2.8E-02		7.8E+00	9.0E-01	3.3E+00	1.7E-01	1		Yes
1,2-Dinitrobenzene	528-29-0	1.7E+02	O	5.3E-08	2.2E-06	No	0	4.5E-02	8.3E-06	3.6E+02		7.2E-01	7.2E-01	1.3E+02	1.3E+05			1.1E+02	9.2E-01	0.1	1			2.4E-03		2.2E+00	1.0E+00	9.2E-01	1.2E-02	1		Yes
1,3-Dinitrobenzene	99-65-0	1.7E+02	O	4.9E-08	2.0E-06	No	0	4.8E-02	9.2E-06	3.5E+02		7.0E-01	7.0E-01	5.3E+02	5.3E+05			4.3E+02	9.0E-01	0.1	1			1.7E-03		2.2E+00	1.0E+00	9.2E-01	8.7E-03	1		Yes
1,4-Dinitrobenzene	100-25-4	1.7E+02	O	8.4E-08	3.4E-06	No	0	4.9E-02	9.4E-06	3.5E+02		7.0E-01	7.0E-01	6.9E+01	6.9E+04			5.5E+01	9.0E-01	0.1	1			1.7E-03		2.2E+00	1.0E+00	9.2E-01	8.3E-03	1		Yes
2,4-Dinitrophenol	51-28-5	1.8E+02	O	8.6E-08	3.5E-06	No	0	4.1E-02	9.1E-06	4.6E+02		9.2E-01	9.2E-01	2.8E+03	2.8E+06			2.9E+03	1.1E+00	0.1	1			1.9E-03		2.7E+00	1.0E+00	1.1E+00	9.8E-03	1		Yes
Dinitrotoluene mixture	25321-14-6	5.5E+02	O	9.3E-08	3.8E-06	No	0	2.8E-02	3.3E-06	5.9E+02		1.2E+00	1.2E+00	2.7E+02	2.7E+05			3.4E+02	1.4E+00	0.1	1			4.2E-03		2.9E+02	8.0E-01	1.2E+02	3.7E-02	1		Yes
2,4-Dinitrotoluene	121-14-2	1.8E+02	O	5.4E-08	2.2E-06	No	0	3.8E-02	7.9E-06	5.8E+02		1.2E+00	1.2E+00	2.0E+02	2.0E+05			2.5E+02	1.4E+00	0.102	1			3.1E-03		2.6E+00	1.0E+00	1.1E+00	1.6E-02	1		Yes
2,6-Dinitrotoluene	606-20-2	1.8E+02	O	7.5E-07	3.1E-05	No	0	3.7E-02	7.8E-06	5.9E+02		1.2E+00	1.2E+00	1.8E+02	1.8E+05			2.3E+02	1.4E+00	0.099	1			3.7E-03		2.6E+00	1.0E+00	1.1E+00	1.9E-02	1		Yes
Dinoseb	88-85-7	2.4E+02	O	4.6E-07	1.9E-05	No	0	2.5E-02	6.5E-06	4.3E+03		8.6E+00	8.6E+00	5.2E+01	5.2E+04			4.5E+02	8.8E+00	0.1	1	7	7	1.6E-02		5.6E+00	9.0E-01	2.3E+00	9.7E-02	1		Yes
1,4-Dioxane	123-91-1	8.8E+01	O	4.8E-06	2.0E-04	Yes	1	8.7E-02	1.1E-05	2.6E+00		5.3E-03	5.3E-03	1.0E+06	1.0E+09	9.3E-06	4.0E+04	1.1E+05	2.1E-01		1			3.3E-04		7.9E-01	1.0E+00	3.3E-01	1.2E-03	1		Yes
Diphenamid	957-51-7	2.4E+02	O	3.6E-11	1.5E-09	No	0	2.4E-02	6.2E-06	4.8E+03		9.6E+00	9.6E+00	2.6E+02	2.6E+05			2.5E+03	9.8E+00	0.1	1			5.6E-03		5.5E+00	1.0E+00	2.3E+00	3.3E-02	1		Yes
Diphenylamine	122-39-4	1.7E+02	O	2.7E-06	1.1E-04	No	0	4.2E-02	7.6E-06	8.3E+02		1.7E+00	1.7E+00	5.3E+01	5.3E+04			9.3E+01	1.9E+00	0.1	1			3.7E-02		2.2E+00	1.0E+00	9.3E-01	1.9E-01	1		Yes
N,N-Diphenyl-1,4 benzenediamine (DPPD)	74-31-7	2.6E+02	O	2.1E-10	8.4E-09	No	0	4.7E-02	5.4E-06	5.2E+04		1.0E+02	1.0E+02	7.4E+00	7.4E+03			7.6E+02	1.0E+02	0.1	1			2.6E-02		7.2E+00	9.0E-01	3.0E+00	1.6E-01	1		Yes
1,2-Diphenylhydrazine	122-66-7	1.8E+02	O	4.8E-07	2.0E-05	No	0	3.4E-02	7.2E-06	1.5E+03		3.0E+00	3.0E+00	2.2E+02	2.2E+05			6.9E+02	3.2E+00	0.1	1			1.3E-02		2.7E+00	1.0E+00	1.1E+00	6.8E-02	1		Yes
Diphenyl sulfone	127-63-9	2.2E+02	O	2.5E-07	1.0E-05	No	0	2.7E-02	6.9E-06	1.1E+03		2.2E+00	2.2E+00	3.1E+02	3.1E+05			7.3E+02	2.4E+00	0.1	1			3.7E-03		4.2E+00	1.0E+00	1.8E+00	2.1E-02	1		Yes
Diquat dibromide (Diquat)	85-00-7	3.4E+02	O	1.4E-13	5.8E-12	No	0	2.1E-02	5.2E-06	9.3E+03		1.9E+01	1.9E+01	7.1E+05	7.1E+08			1.3E+07	1.9E+01	0.1	1	20	20	2.4E-07		2.1E+01	1.0E+00	8.9E+00	1.7E-06	1		No
Direct black 38	1937-37-7	7.8E+02	O	8.2E-40	3.4E-38	No	0	2.2E-02	2.6E-06	2.4E+08		4.8E+05	4.8E+05	3.0E+03	3.0E+06			1.5E+09	4.8E+05	0.1	1			2.1E-04		5.9E+03	1.0E+00	2.4E+03	2.2E-03	1		No
Direct blue 6	2602-46-2	9.3E+02	O	9.1E-44	3.7E-42	No	0	2.0E-02	2.3E-06	7.9E+08		1.6E+06	1.6E+06	1.4E-04	1.4E-01			2.2E+02	1.6E+06	0.1	1			1.7E-09		4.2E+04	1.0E+00	1.8E+04	2.0E-08	1		No
Direct brown 95	16071-86-6	7.6E+02	O			No	0	2.3E-02	2.7E-06	7.0E+06		1.4E+04	1.4E+04	1.0E+06	1.0E+09				1.4E+04	0.1	1			3.9E-12		4.6E+03	1.0E+00	1.9E+03	4.1E-11	1		No
Disulfoton	298-04-4	2.7E+02	O	2.2E-06	8.8E-05	No	0	2.3E-02	5.7E-06	8.4E+02		1.7E+00	1.7E+00	1.6E+01	1.6E+04			2.9E+01	1.9E+00	0.1	1			2.1E-02		8.7E+00	9.0E-01	3.6E+00	1.4E-01	1		Yes
1,4-Dithiane	505-29-3	1.2E+02	O	4.2E-05	1.7E-03	No	1	6.8E-02	9.3E-06	1.5E+02		2.9E-01	2.9E-01	3.0E+03	3.0E+06	1.6E-05	4.5E+04	1.2E+03	4.9E-01		1			1.1E-03		1.2E+00	1.0E+00	5.0E-01	4.6E-03	1		Yes
Diuron	330-54-1	2.3E+02	O	5.0E-10	2.1E-08	No	0	5.0E-02	5.9E-06	1.1E+02		2.2E-01	2.2E-01	4.2E+01	4.2E+04			1.3E+01	4.2E-01	0.1	1			4.7E-03		5.1E+00	1.0E+00	2.1E+00	2.7E-02	1		Yes
Dodine	2439-10-3	2.9E+02	O	9.0E-11	3.7E-09	No	0	4.4E-02	5.1E-06	2.5E+03		5.0E+00	5.0E+00	6.3E+02	6.3E+05			3.2E+03	5.2E+00	0.1	1			2.2E-04		1.0E+01	1.0E+00	4.3E+00	1.4E-03	1		Yes
Endosulfan	115-29-7	4.1E+02	O	6.5E-05	2.7E-03	No	1	2.2E-02	5.8E-06	6.8E+03		1.4E+01	1.4E+01	3.3E-01	3.3E+02	2.4E-07	4.1E+05	4.4E+00	1.4E+01		1			2.9E-03		4.8E+01	9.0E-01	2.0E+01	2.2E-02	1		Yes
Endothall	145-73-3	1.9E+02	O	3.9E-16	1.6E-14	No	0	3.7E-02	8.2E-06	1.9E+01		3.9E-02	3.9E-02	1.0E+05	1.0E+08			1.4E+04	2.4E-01	0.1	1	100	100	2.6E-03		2.8E+00	1.0E+00	1.2E+00	1.4E-02	1		Yes
Endrin	72-20-8	3.8E+02	O	6.4E-06	2.6E-04	No	0	3.6E-02	4.2E-06	2.0E+04		4.0E+01	4.0E+01	2.5E-01	2.5E+02			1.0E+01	4.0E+01	0.1	1	2	2	3.3E-02		3.4E+01	8.0E-01	1.4E+01	2.4E-01	1		Yes
Enilconazole (Imazalil)	35554-44-0	3.0E+02	O	2.6E-09	1.1E-07	No	0	2.2E-02	5.7E-06	8.5E+03		1.7E+01	1.7E+01	1.8E+02	1.8E+05			3.1E+03	1.7E+01	0.1	1			1.2E-02		1.2E+01	9.0E-01	4.9E+00	7.7E-02	1		Yes
Epichlorohydrin	106-89-8	9.3E+01	O	3.0E-05	1.2E-03	Yes	1	8.9E-02	1.1E-05	9.9E+00		2.0E-02	2.0E-02	6.6E+04	6.6E+07	5.0E-05	1.9E+04	7.9E+03	2.2E-01		1			9.4E-04		8.3E-01	1.0E+00	3.5E-01	3.5E-03	1		Yes
1,2-Epoxybutane	106-88-7	7.2E+01	O	1.8E-04	7.4E-03	Yes	1	9.3E-02	1.0E-05	9.9E+00		2.0E-02	2.0E-02	9.5E+04	9.5E+07	3.0E-04	7.7E+03	1.2E+04	2.2E-01		1			2.3E-03		6.4E-01	1.0E+00	2.7E-01	7.5E-03	1		Yes
S-Ethyl dipropylthiocarbamate (EPTC)	759-94-4	1.9E+02	O	1.6E-05	6.5E-04	No	1	2.9E-02	6.4E-06	1.6E+02		3.3E-01	3.3E-01	3.8E+02	3.8E+05	2.4E-06	1.2E+05	1.6E+02	5.3E-01		1			1.8E-02		2.9E+00	1.0E+00	1.2E+00	9.7E-02	1		Yes
2-Chloroethyl phosphonic acid (Ethephon)	16672-87-0	1.4E+02	O	5.7E-12	2.3E-10	No	0	5.5E-02	8.6E-06	5.0E+00		1.0E-02	1.0E-02	1.0E+06	1.0E+09			1.1E+05	2.1E-01	0.1	1			1.7E-04		1.6E+00	1.0E+00	6.8E-01	8.0E-04	1		Yes
Ethion	563-12-2	3.8E+02	O	3.8E-07	1.6E-05	No	0	1.9E-02	4.8E-06	8.8E+02		1.8E+00	1.8E+00	2.0E+00	2.0E+03			3.7E+00	2.0E+00	0.1	1			2.6E-02		3.6E+01	8.0E-01	1.5E+01	1.9E-01	1		Yes
2-Ethoxyethanol	110-80-5	9.0E+01	O	4.7E-07	1.9E-05	Yes	1	8.2E-02	9.7E-06	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09	1.4E-06	9.8E+04	1.0E+05	2.0E-01		1			3.0E-04		8.1E-01	1.0E+00	3.4E-01	1.1E-03	1		Yes
2-Ethoxyethanol acetate	111-15-9	1.3E+02	O	3.2E-06	1.3E-04	Yes	1	5.7E-02	8.0E-06	4.5E+00		9.1E-03	9.1E-03	1.9E+05	1.9E+08	4.1E-06	6.1E+04	2.0E+04	2.1E-01		1			7.0E-04		1.4E+00	1.0E+00	5.8E-01	3.1E-03	1		Yes
Ethyl acetate	141-78-6	8.8E+01	O	1.3E-04	5.5E-03	Yes	1	8.2E-02	9.7E-06	5.6E+00		1.1E-02	1.1E-02	8.0E+04	8.0E+07	2.1E-04	8.6E+03	9.0E+03	2.1E-01		1			1.5E-03		7.9E-01	1.0E+00	3.3E-01	5.5E-03	1		Yes
Ethyl acrylate	140-88-5	1.0E+02	O	3.4E-04	1.4E-02	Yes	1	7.5E-02	9.1E-06	1.1E+01		2.1E-02	2.1E-02	1.5E+04	1.5E+07	4.4E-04	6.3E+03	1.9E+03	2.2E-01		1			3.2E-03		9.2E-01	1.0E+00	3.8E-01	1.2E-02	1		Yes
Ethylbenzene	100-41-4	1.1E+02	O	7.9E-03	3.2E-01	Yes	1	6.8E-02	8.5E-06	4.5E+02		8.9E-01	8.9E-01	1.7E+02	1.7E+05	1.1E-03	5.7E+03	1.8E+02	1.1E+00		1	700	700	4.9E-02		9.9E-01	1.0E+00	4.1E-01	2.0E-01	1		Yes
Ethyl chloride (Chloroethane)	75-00-3	6.5E+01	O	1.1E-02	4.5E-01	Yes	1	1.0E-01	1.2E-05	2.2E+01		4.3E-02	4.3E-02	6.7E+03	6.7E+06	1.1E-02	1.3E+03	1.5E+03	2.8E-01		1			6.1E-03		5.8E-01	1.0E+00	2.4E-01	1.9E-02	1		Yes
Ethylene cyanohydrin	109-78-4	7.1E+01	O	7.5E-09	3.1E-07	No	0	1.0E-01	1.2E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09			1.0E+05	2.0E-01	0.1	1			1.5E-04		6.3E-01	1.0E+00	2.6E-01	4.8E-04	1		Yes
Ethylene diamine	107-15-3	6.0E+01	O	1.7E-09	7.1E-08	Yes	1	1.1E-01	1.2E-05	1.5E+01		3.0E-02	3.0E-02	1.0E+06	1.0E+09	6.0E-07	1.8E+05	1.3E+05	2.3E-01		1			3.2E-05		5.5E-01	1.0E+00	2.3E-01	9.5E-05	1		No
Ethylene glycol	107-21-1	6.2E+01	O	6.0E-08	2.5E-06	No	0	1.2E-01	1.4E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09			1.0E+05	2.0E-01	0.1	1			8.8E-05		5.6E-01	1.0E+00	2.3E-01	2.7E-04	1		Yes
Ethylene glycol, monobutyl ether	111-76-2	1.2E+02	O	1.6E-06	6.5E-05	No	0	6.3E-02	8.1E-06	2.8E+00		5.6E-03	5.6E-03	1.0E+06	1.0E+09			1.1E+05	2.1E-01	0.1	1			1.2E-03		1.2E+00	1.0E+00	4.8E-01	5.1E-03	1		Yes
Ethylene oxide	75-21-8	4.4E+01	O	1.5E-04	6.1E-03	Yes	1	1.3E-01	1.5E-05	3.2E+00		6.5E-03	6.5E-03	1.0E+06	1.0E+09	4.0E-04	6.1E+03	1.1E+05	2.1E-01		1			5.6E-04		4.5E-01	1.0E+00	1.9E-01	1.4E-03	1	M	Yes
Ethylene thiourea (ETU)	96-45-7	1.0E+02	O	1.4E-11	5.6E-10	No	0	8.7E-02	1.0E-05	1.3E+01		2.6E-02	2.6E-02	2.0E+04	2.0E+07			2.5E+03	2.3E-01	0.1	1			1.5E-04		9.4E-01	1.0E+00	3.9E-01	5.9E-04	1		Yes
Ethyl ether	60-29-7	7.4E+01	O	1.2E-03	5.0E-02	Yes	1	8.5E-02	9.4E-06	9.7E+00		1.9E-02	1.9E-02	6.0E+04	6.0E+07	1.8E-03	3.1E+03	7.8E+03	2.2E-01		1			2.4E-03		6.6E-01	1.0E+00	2.7E-01	7.8E-03	1		Yes
Ethyl methacrylate	97-63-2	1.1E+02	O	5.7E-04	2.3E-02	Yes	1	6.5E-02	8.4E-06	1.7E+01		3.3E-02	3.3E-02	5.4E+03	5.4E+06	5.9E-04	5.8E+03	7.4E+02	2.4E-01		1			7.0E-03		1.1E+00	1.0E+00	4.6E-01	2.9E-02	1		Yes
Ethyl p-nitrophenyl phenylphosphorothioate (EPN)	2104-64-5	3.2E+02	O	4.4E-07	1.8E-05	No	0	2.2E-02	5.5E-06	1.5E+04		3.1E+01	3.1E+01	3.1E+00	3.1E+03			9.7E+01	3.1E+01	0.1	1			3.6E-02		1.6E+01	8.0E-01	6.8E+00	2.5E-01	1		Yes
Ethylphthalyl ethyl glycolate	84-72-0	2.8E+02	O	6.6E-09	2.7E-07	No	0	4.4E-02	5.2E-06	1.0E+03		2.0E+00	2.0E+00	2.2E+02	2.2E+05			4.6E+02	2.2E+00	0.1	1			1.2E-03		9.4E+00	1.0E+00	3.9E+00	7.7E-03	1		Yes
Fenamiphos	22224-92-6	3.0E+02	O	1.2E-09	4.9E-08	No	0	2.1E-02	5.4E-06	4.0E+02		8.0E-01	8.0E-01	3.3E+02	3.3E+05			2.9E+02	1.0E+00	0.1	1			4.4E-03		1.3E+01	9.0E-01	5.3E+00	2.9E-02	1		Yes
Fenpropathrin (Danitol)	39515-41-8	3.5E+02	O	7.6E-06	3.1E-04	No	0	3.8E-02	4.5E-06	2.2E+04		4.5E+01	4.5E+01	3.3E-01	3.3E+02			1.5E+01	4.5E+01	0.1	1			1.7E-01		3.7E+01	8.0E-01	9.5E+00	1.2E+00	1		Yes
Fenvalerate (Pydrin)	51630-58-1	4.2E+02	O	3.5E-08	1.4E-06	No	0	1.8E-02	4.4E-06	3.2E+05		6.3E+02	6.3E+02	2.4E-02	2.4E+01			1.5E+01	6.3E+02	0.1	1			9.4E-02		9.1E+01	7.0E-01	2.4E+01	7.4E-01	1		No
Fluometuron	2164-17-2	2.3E+02	O	2.6E-09	1.1E-07	No	0	5.0E-02	5.9E-06	2.9E+02		5.7E-01	5.7E-01	1.1E+02	1.1E+05			7.4E+01	7.7E-01	0.1	1			3.2E-03		5.0E+00	1.0E+00	2.1E+00	1.9E-02	1		Yes
Fluoride	16984-48-8	3.8E+01	I			No	0				1.5E+02	1.5E+02	1.5E+02	1.7E+00	1.7E+03				1.5E+02		1	4000	4000		1.0E-03	4.1E-01	1.0E+00	1.7E-01	2.4E-03	1		Yes
Fluoridone	59756-60-4	3.3E+02	O	8.1E-09	3.3E-07	No	0	4.0E-02	4.7E-06	5.7E+04		1.1E+02	1.1E+02	1.2E+01	1.2E+04			1.4E+03	1.1E+02	0.1	1			2.8E-03		1.8E+01	9.0E-01	7.3E+00	2.0E-02	1		Yes
Flurprimidol	56425-91-3	3.1E+02	O	1.3E-09	5.4E-08	No	0	4.1E-02	4.8E-06	2.2E+03		4.4E+00	4.4E+00	1.1E+02	1.1E+05			5.1E+02	4.6E+00	0.1	1			4.6E-03		1.4E+01	9.0E-01	5.9E+00	3.1E-02	1		Yes
Flusilazole (NuStar)	85509-19-9	3.2E+02	O	2.3E-09	9.2E-08	No	0	4.1E-02	4.8E-06	8.1E+04		1.6E+02	1.6E+02	5.4E+01	5.4E+04			8.8E+03	1.6E+02		1			7.7E-03		1.5E+01	9.0E-01	6.1E+00	5.2E-02	1		Yes
Flutolanil	66332-96-5	3.2E+02	O	3.2E-09	1.3E-07	No	0	4.0E-02	4.7E-06	2.6E+03		5.1E+00	5.1E+00	6.5E+00	6.5E+03			3.4E+01	5.3E+00	0.1	1			6.9E-03		1.6E+01	9.0E-01	6.8E+00	4.8E-02	1		Yes
Fluvalinate	69409-94-5	5.0E+02	O	1.5E-08	5.9E-07	No	0	3.0E-02	3.5E-06	7.3E+05		1.5E+03	1.5E+03	5.0E-03	5.0E+00			7.3E+00	1.5E+03	0.1	1			7.9E-02		2.7E+02	6.0E-01	6.9E+01	6.8E-01	1		No
Folpet	133-07-3	3.0E+02	O	7.7E-08	3.1E-06	No	0	4.3E-02	5.0E-06	1.8E+01		3.5E-02	3.5E-02	8.0E-01	8.0E+02			1.1E-01	2.4E-01	0.1	1			2.7E-03		1.2E+01	1.0E+00	4.8E+00	1.8E-02	1		Yes
Fomesafen	72178-02-0	4.4E+02	O	7.5E-13	3.1E-11	No	0	1.9E-02	4.6E-06	1.5E+03		3.1E+00	3.1E+00	5.0E+01	5.0E+04			1.6E+02	3.3E+00	0.1	1			4.6E-04		7.2E+01	1.0E+00	3.0E+01	3.7E-03	1		Yes
Fonofos	944-22-9	2.5E+02	O	7.0E-06	2.9E-04	No	0	2.4E-02	6.1E-06	8.6E+02		1.7E+00	1.7E+00	1.6E+01	1.6E+04			2.8E+01	1.9E+00	0.1	1			2.7E-02		6.0E+00	9.0E-01	2.5E+00	1.6E-01	1		Yes
Formaldehyde	50-00-0	3.0E+01	O	3.4E-07	1.4E-05	Yes	1	1.7E-01	1.7E-05	1.0E+00		2.0E-03	2.0E-03	4.0E+05	4.0E+08	2.3E-06	7.8E+04	4.1E+04	2.0E-01		1			1.8E-03		3.7E-01	1.0E+00	1.5E-01	3.8E-03	1		Yes
Formic acid	64-18-6	4.6E+01	O	1.7E-07	6.8E-06	Yes	1	1.5E-01	1.7E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09	1.6E-06	9.3E+04	1.0E+05	2.0E-01		1			3.8E-04		4.6E-01	1.0E+00	1.9E-01	9.9E-04	1		Yes

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-2: CHEMICAL-SPECIFIC PARAMETERS

Contaminant	CAS	MW (g/mol)	Organic/ Inorganic	Henry's Law Constant H_units (atm-m^3/mol)	Henry's Law Constant H' (H_unitless) (unitless)	VP>1?	VOL	D_i (cm^2/s)	D_w (cm^2/s)	K_{oc} (organics) (cm^3/g)	K_d (inorganics) (cm^3/g)	$K_{d\ VF}$ (cm^3/g)	K_d_s_to_gw (cm^3/g)	S (mg/L-water)	S (µg/L-water)	D_A (cm^2/s)	VF (m^3/kg)	SAT (mg/kg)	soil-to-gw factor (kg/L)	ABS_d	ABS_{GI}	Title 118 MCL (µg/L)	EPA Fed MCL MCL (µg/L)	Kp.org (cm/hr)	Kp.inorg (cm/hr)	t_star (hr)	FA (unitless)	tau_event (hr)	B (unitless)	RBA (unitless)	Mutagen	In EPD?
Fosetyl-al	39148-24-8	3.5E+02	O	3.2E-14	1.3E-12	No	0	3.8E-02	4.4E-06	6.5E+03		1.3E+01	1.3E+01	1.1E+05	1.1E+08			1.5E+06	1.3E+01	0.1	1			4.1E-07		2.4E+01	1.0E+00	1.0E+01	3.0E-06	1		No
Furan	110-00-9	6.8E+01	O	5.4E-03	2.2E-01	Yes	1	1.0E-01	1.2E-05	8.0E+01		1.6E-01	1.6E-01	1.0E+04	1.0E+07	4.0E-03	2.6E+03	3.0E+03	3.8E-01	0.03	1			5.1E-03		6.1E-01	1.0E+00	2.5E-01	1.6E-02	1		Yes
Furazolidone	67-45-8	2.3E+02	O	3.3E-11	1.3E-09	No	0	5.1E-02	6.0E-06	8.6E+02		1.7E+00	1.7E+00	4.0E+01	4.0E+04			7.3E+01	1.9E+00	0.1	1			8.0E-05		4.6E+00	1.0E+00	1.9E+00	4.6E-04	1		Yes
Furfural	98-01-1	9.6E+01	O	3.8E-06	1.5E-04	Yes	1	8.5E-02	1.1E-05	6.1E+00		1.2E-02	1.2E-02	7.4E+04	7.4E+07	6.8E-06	4.9E+04	8.3E+03	2.1E-01		1			8.5E-04		8.7E-01	1.0E+00	3.6E-01	3.2E-03	1		Yes
Furmecyclox	60568-05-0	2.5E+02	O	6.9E-09	2.8E-07	No	0	4.8E-02	5.6E-06	4.3E+02		8.6E-01	8.6E-01	3.0E-01	3.0E+02			2.9E-01	1.1E+00	0.1	1			5.0E-02		6.4E+00	9.0E-01	2.7E+00	3.0E-01	1		Yes
Furothiazole (Furium)	531-82-8	2.5E+02	O	1.3E-15	5.4E-14	No	0	4.7E-02	5.5E-06	5.8E+02		1.2E+00	1.2E+00	4.2E+03	4.2E+06			5.3E+03	1.4E+00	0.1	1			9.4E-04		6.6E+00	1.0E+00	2.8E+00	5.7E-03	1		Yes
Glufosinate-ammonium	77182-82-2	2.0E+02	O	4.4E-14	1.8E-12	No	0	5.6E-02	6.5E-06	1.0E+01		2.0E-02	2.0E-02	1.4E+06	1.4E+09			1.6E+05	2.2E-01	0.1	1			3.4E-08		3.2E+00	1.0E+00	1.4E+00	1.9E-07	1		No
Glycidaldehyde	765-34-4	7.2E+01	O	5.1E-07	2.1E-05	Yes	1	1.1E-01	1.3E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09	1.9E-06	8.4E+04	1.0E+05	2.0E-01		1			5.2E-04		6.4E-01	1.0E+00	2.7E-01	1.7E-03	1		Yes
Glyphosate	1071-83-6	1.7E+02	O	2.1E-12	8.6E-11	No	0	6.2E-02	7.3E-06	2.1E+03		4.2E+00	4.2E+00	1.1E+04	1.1E+07			4.5E+04	4.4E+00	0.1	1	700	700	4.5E-08		2.2E+00	1.0E+00	9.3E-01	2.3E-07	1		No
Haloxyfop-methyl	69806-40-2	3.8E+02	O	3.2E-07	1.3E-05	No	0	3.6E-02	4.3E-06	5.5E+03		1.1E+01	1.1E+01	9.3E+00	9.3E+03			1.0E+02	1.1E+01	0.1	1			6.0E-03		3.2E+01	9.0E-01	1.3E+01	4.5E-02	1		Yes
Thifensulfuron-methyl (Harmony)	79277-27-3	3.9E+02	O	4.1E-14	1.7E-12	No	0	3.6E-02	4.2E-06	5.1E+01		1.0E-01	1.0E-01	2.2E+03	2.2E+06			4.5E+02	3.0E-01	0.1	1			1.1E-04		3.7E+01	1.0E+00	1.6E+01	8.6E-04	1		Yes
Heptachlor	76-44-8	3.7E+02	O	2.9E-04	1.2E-02	No	1	2.2E-02	5.7E-06	4.1E+04		8.3E+01	8.3E+01	1.8E-01	1.8E+02	1.7E-07	4.8E+05	1.5E+01	8.3E+01		1	0.4	0.4	1.4E-01		5.0E+01	8.0E-01	1.3E+01	1.1E+00	1		Yes
Heptachlor epoxide	1024-57-3	3.9E+02	O	2.1E-05	8.6E-04	No	1	2.4E-02	6.2E-06	1.0E+04		2.0E+01	2.0E+01	2.0E-01	2.0E+02	5.6E-08	8.4E+05	4.1E+00	2.0E+01		1	0.2	0.2	2.1E-02		3.8E+01	8.0E-01	1.6E+01	1.6E-01	1		Yes
Hexabromobenzene	87-82-1	5.5E+02	O	2.8E-05	1.1E-03	No	1	2.5E-02	6.6E-06	2.8E+03		5.6E+00	5.6E+00	1.6E-04	1.6E-01	2.7E-07	3.8E+05	9.1E-04	5.8E+00		1			1.4E-02		3.1E+02	7.0E-01	1.3E+02	1.2E-01	1		No
Hexachlorobenzene	118-74-1	2.8E+02	O	1.7E-03	7.0E-02	No	1	2.9E-02	7.8E-06	6.2E+03		1.2E+01	1.2E+01	6.2E-03	6.2E+00	8.6E-06	6.8E+04	7.8E-02	1.3E+01		1	1	1	2.5E-01		1.7E+01	9.0E-01	4.1E+00	1.6E+00	1		No
Hexachlorobutadiene	87-68-3	2.6E+02	O	1.0E-02	4.2E-01	No	1	2.7E-02	7.0E-06	8.5E+02		1.7E+00	1.7E+00	3.2E+00	3.2E+03	3.2E-04	1.1E+04	6.0E+00	1.9E+00		1			8.1E-02		7.3E+00	9.0E-01	3.0E+00	5.0E-01	1		Yes
alpha-Hexachlorocyclohexane (alpha-HCH)	319-84-6	2.9E+02	O	6.7E-06	2.7E-04	No	0	4.3E-02	5.1E-06	2.8E+03		5.6E+00	5.6E+00	2.0E+00	2.0E+03			1.1E+01	5.8E+00	0.1	1			2.1E-02		1.1E+01	9.0E-01	4.5E+00	1.4E-01	1		Yes
beta-Hexachlorocyclohexane (beta-HCH)	319-85-7	2.9E+02	O	4.4E-07	1.8E-05	No	0	2.8E-02	7.4E-06	2.8E+03		5.6E+00	5.6E+00	2.4E-01	2.4E+02			1.4E+00	5.8E+00	0.1	1			2.1E-02		1.1E+01	9.0E-01	4.5E+00	1.4E-01	1		Yes
gamma-Hexachlorocyclohexane (Lindane)	58-89-9	2.9E+02	O	5.1E-06	2.1E-04	No	0	4.3E-02	5.1E-06	2.8E+03		5.6E+00	5.6E+00	7.3E+00	7.3E+03			4.2E+01	5.8E+00	0.04	1	0.2	0.2	2.1E-02		1.1E+01	9.0E-01	4.5E+00	1.4E-01	1		Yes
Hexachlorocyclohexane technical	608-73-1	2.9E+02	O	5.1E-06	2.1E-04	No	0	4.3E-02	5.1E-06	2.8E+03		5.6E+00	5.6E+00	8.0E+00	8.0E+03			4.6E+01	5.8E+00	0.1	1			2.1E-02		1.1E+01	9.0E-01	4.5E+00	1.4E-01	1		Yes
Hexachlorocyclopentadiene	77-47-4	2.7E+02	O	2.7E-02	1.1E+00	No	1	2.7E-02	7.2E-06	1.4E+03		2.8E+00	2.8E+00	1.8E+00	1.8E+03	5.1E-04	8.5E+03	5.6E+00	3.1E+00		1	50	50	1.0E-01		1.4E+01	9.0E-01	3.5E+00	6.5E-01	1		Yes
Hexachloroethane	67-72-1	2.4E+02	O	3.9E-03	1.6E-01	No	1	3.2E-02	8.9E-06	2.0E+02		3.9E-01	3.9E-01	5.0E+01	5.0E+04	5.2E-04	8.0E+03	2.6E+01	6.1E-01		1			4.2E-02		5.3E+00	1.0E+00	2.2E+00	2.5E-01	1		Yes
Hexachlorophene	70-30-4	4.1E+02	O	5.5E-13	2.2E-11	No	0	3.5E-02	4.0E-06	6.7E+05		1.3E+03	1.3E+03	1.4E+02	1.4E+05			1.9E+05	1.3E+03	0.1	1			8.4E-01		8.9E+01	0.0E+00	2.0E+01	6.5E+00	1		No
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX/Cyclonite)	121-82-4	2.2E+02	O	2.0E-11	8.2E-10	No	0	3.1E-02	8.5E-06	8.9E+01		1.8E-01	1.8E-01	6.0E+01	6.0E+04			1.7E+01	3.8E-01	0.015	1			3.4E-04		4.4E+00	1.0E+00	1.8E+00	1.9E-03	1		Yes
1,6-Hexamethylene diisocyanate	822-06-0	1.7E+02	O	4.8E-05	2.0E-03	No	1	4.0E-02	7.2E-06	4.8E+03		9.6E+00	9.6E+00	1.2E+02	1.2E+05	4.4E-07	3.0E+05	1.1E+03	9.8E+00		1			2.4E-02		2.2E+00	1.0E+00	9.2E-01	1.2E-01	1		Yes
n-Hexane	110-54-3	8.6E+01	O	1.8E+00	7.4E+01	Yes	1	7.3E-02	8.2E-06	1.3E+02		2.6E-01	2.6E-01	9.5E+00	9.5E+03	2.0E-02	8.3E+02	1.4E+02	7.0E+00		1			2.0E-01		1.2E+00	1.0E+00	3.2E-01	7.2E-01	1		Yes
Hexazinone	51235-04-2	2.5E+02	O	2.3E-12	9.2E-11	No	0	2.5E-02	6.3E-06	1.3E+02		2.6E-01	2.6E-01	3.3E+04	3.3E+07			1.2E+04	4.6E-01	0.1	1			1.0E-03		6.5E+00	1.0E+00	2.7E+00	6.2E-03	1		Yes
Hexythiazox (Savey)	78587-05-0	3.5E+02	O	2.4E-08	9.7E-07	No	0	3.8E-02	4.4E-06	2.1E+03		4.2E+00	4.2E+00	5.0E-01	5.0E+02			2.2E+00	4.4E+00	0.1	1			8.3E-02		2.4E+01	8.0E-01	1.0E+01	6.0E-01	1		Yes
Hydramethylnon (Amdro)	67485-29-4	4.9E+02	O	2.2E-06	9.0E-05	No	0	3.0E-02	3.6E-06	1.8E+08		3.6E+05	3.6E+05	6.0E-03	6.0E+00			2.2E+03	3.6E+05	0.1	1			9.0E-05		1.5E+02	1.0E+00	6.2E+01	7.7E-04	1		Yes
Hydrazine, hydrazine sulfate	302-01-2	3.2E+01	O	6.1E-07	2.5E-05	Yes	1	1.7E-01	1.9E-05					1.0E+06	1.0E+09						1			4.4E-05		3.8E-01	1.0E+00	1.6E-01	9.5E-05	1		Yes
Hydrazine, dimethyl	57-14-7	6.0E+01	O	1.3E-05	5.3E-04	Yes	1	1.0E-01	1.1E-05	1.2E+01		2.4E-02	2.4E-02	1.0E+06	1.0E+09	2.4E-05	2.8E+04	1.2E+05	2.2E-01		1			7.3E-05		5.5E-01	1.0E+00	2.3E-01	2.2E-04	1		Yes
Hydrogen chloride	7647-01-0	3.5E+01	O	2.0E+06	8.3E+07	Yes	1	1.9E-01	2.3E-05					6.7E+05	6.7E+08						1			1.0E-03		4.0E-01	1.0E+00	1.7E-01	2.3E-03	1		Yes
Hydrogen sulfide	7783-06-4	3.4E+01	O	8.6E-03	3.5E-01	Yes	1	1.9E-01	2.2E-05					3.7E+03	3.7E+06						1			1.0E-03		3.9E-01	1.0E+00	1.6E-01	2.2E-03	1		Yes
p-Hydroquinone	123-31-9	1.1E+02	O	4.7E-11	1.9E-09	No	0	8.0E-02	1.1E-05	2.4E+02		4.8E-01	4.8E-01	7.2E+04	7.2E+07			4.2E+04	6.8E-01	0.1	1			9.3E-04		1.0E+00	1.0E+00	4.3E-01	3.8E-03	1		Yes
Imazaquin	81335-37-7	3.1E+02	O	6.9E-18	2.8E-16	No	0	4.1E-02	4.8E-06	2.4E+03		4.8E+00	4.8E+00	9.0E+01	9.0E+04			4.4E+02	5.0E+00	0.1	1			4.8E-04		1.4E+01	1.0E+00	5.8E+00	3.3E-03	1		Yes
Imazethapyr (Pursuit)	81335-77-5	2.9E+02	O	1.0E-16	4.3E-15	No	0	4.3E-02	5.1E-06	3.4E+02		6.8E-01	6.8E-01	1.4E+03	1.4E+06			1.1E+03	8.8E-01	0.1	1			2.0E-03		1.1E+01	1.0E+00	4.4E+00	1.3E-02	1		Yes
Iprodione	36734-19-7	3.3E+02	O	3.1E-09	1.3E-07	No	0	4.0E-02	4.6E-06	5.3E+01		1.1E-01	1.1E-01	1.4E+01	1.4E+04			2.9E+00	3.1E-01	0.1	1			2.2E-03		1.8E+01	9.0E-01	7.4E+00	1.5E-02	1		Yes
Iron	7439-89-6	5.6E+01	I			No	0				2.5E+01	2.5E+01	2.5E+01						2.5E+01		1	300			1.0E-03	5.2E-01	1.0E+00	2.2E-01	2.9E-03	1		Yes
Isobutanol (Isobutyl alcohol)	78-83-1	7.4E+01	O	9.8E-06	4.0E-04	Yes	1	9.0E-02	1.0E-05	2.9E+00		5.8E-03	5.8E-03	8.5E+04	8.5E+07	1.9E-05	2.8E+04	9.0E+03	2.1E-01		1			1.9E-03		6.6E-01	1.0E+00	2.7E-01	6.4E-03	1		Yes
Isophorone	78-59-1	1.4E+02	O	6.6E-06	2.7E-04	No	0	5.3E-02	7.5E-06	6.5E+01		1.3E-01	1.3E-01	1.2E+04	1.2E+07			2.8E+03	3.3E-01	0.1	1			3.5E-03		1.5E+00	1.0E+00	6.2E-01	1.6E-02	1		Yes
Isopropalin	33820-53-0	3.1E+02	O	1.1E-04	4.5E-03	No	1	2.1E-02	5.3E-06	1.1E+04		2.3E+01	2.3E+01	1.1E-01	1.1E+02	2.3E-07	4.2E+05	2.5E+00	2.3E+01		1			2.1E-01		2.2E+01	8.0E-01	5.7E+00	1.4E+00	1		Yes
Isopropyl methyl phosphonic acid	1832-54-8	1.4E+02	O	6.9E-09	2.8E-07	No	0	7.1E-02	8.3E-06	7.7E+00		1.5E-02	1.5E-02	5.0E+04	5.0E+07			5.8E+03	2.2E-01	0.1	1			4.0E-04		1.5E+00	1.0E+00	6.2E-01	1.8E-03	1		Yes
Isoxaben	82558-50-7	3.3E+02	O	1.3E-09	5.2E-08	No	0	4.0E-02	4.6E-06	1.3E+03		2.5E+00	2.5E+00	1.4E+00	1.4E+03			3.7E+00	2.7E+00	0.1	1			8.9E-03		1.8E+01	9.0E-01	7.6E+00	6.2E-02	1		Yes
Lactofen	77501-63-4	4.6E+02	O	4.7E-07	1.9E-05	No	0	3.2E-02	3.7E-06	2.3E+04		4.6E+01	4.6E+01	1.0E-01	1.0E+02			4.6E+00	4.6E+01	0.1	1			6.3E-03		9.7E+01	9.0E-01	4.1E+01	5.2E-02	1		Yes
Lead +++	7439-92-1	2.1E+02	I			No	0				9.0E+02	9.0E+02	9.0E+02						9.0E+02		1	15	15		1.0E-04	3.7E+00	1.0E+00	1.5E+00	5.5E-04	1		Yes
Lead (tetraethyl)	78-00-2	3.2E+02	O	5.7E-01	2.3E+01	No	1	2.5E-02	6.4E-06	6.5E+02		1.3E+00	1.3E+00	2.9E-01	2.9E+02	5.3E-03	1.9E+03	1.7E+00	3.6E+00		1			1.4E-02		1.6E+01	9.0E-01	6.8E+00	9.5E-02	1		Yes
Linuron	330-55-2	2.5E+02	O	6.3E-09	2.6E-07	No	0	4.8E-02	5.6E-06	3.4E+02		6.8E-01	6.8E-01	7.5E+01	7.5E+04			5.8E+01	8.8E-01	0.1	1			8.4E-03		6.3E+00	9.0E-01	2.6E+00	5.1E-02	1		Yes
Lithium	7439-93-2	6.9E+00	I			No	0				3.0E+02	3.0E+02	3.0E+02						3.0E+02		1				1.0E-03	2.8E-01	1.0E+00	1.2E-01	1.0E-03	1		Yes
Malathion	121-75-5	3.3E+02	O	4.9E-09	2.0E-07	No	0	2.1E-02	5.2E-06	3.1E+01		6.3E-02	6.3E-02	1.4E+02	1.4E+05			2.3E+01	2.6E-01	0.1	1			8.1E-04		1.8E+01	1.0E+00	7.4E+00	5.7E-03	1		Yes
Maleic anhydride	108-31-6	9.8E+01	O	3.9E-06	1.6E-04	No	0	8.8E-02	1.1E-05	1.0E+00		2.0E-03	2.0E-03	1.6E+05	1.6E+08			1.7E+04	2.0E-01	0.1	1			5.3E-03		8.9E-01	1.0E+00	3.7E-01	2.0E-02	1		Yes
Maleic hydrazide	123-33-1	1.1E+02	O	2.7E-11	1.1E-09	No	0	8.2E-02	9.5E-06	3.3E+00		6.6E-03	6.6E-03	4.5E+03	4.5E+06			4.8E+02	2.1E-01	0.1	1			1.0E-04		1.1E+00	1.0E+00	4.5E-01	4.2E-04	1		Yes
Malononitrile	109-77-3	6.6E+01	O	1.3E-07	5.4E-06	No	0	1.2E-01	1.4E-05	3.3E+00		6.7E-03	6.7E-03	1.3E+05	1.3E+08			1.4E+04	2.1E-01	0.1	1			2.7E-04		5.9E-01	1.0E+00	2.5E-01	8.3E-04	1		Yes
Mancozeb	8018-01-7	5.4E+02	O	1.5E-11	6.2E-10	No	0	2.0E-02	5.1E-06	6.1E+02		1.2E+00	1.2E+00	6.2E+00	6.2E+03			8.2E+00	1.4E+00	0.1	1			7.7E-04		2.7E+02	9.0E-01	1.1E+02	6.9E-03	1		Yes
Maneb	12427-38-2	3.0E+02	O	4.9E-09	2.0E-07	No	0	4.3E-02	5.0E-06	6.1E+02		1.2E+00	1.2E+00	6.0E+00	6.0E+03			7.9E+00	1.4E+00	0.1	1			7.7E-04		1.1E+01	1.0E+00	4.7E+00	5.1E-03	1		Yes
Manganese (non-food) +++	7439-96-5	5.5E+01	I			No	0				6.5E+01	6.5E+01	6.5E+01						6.5E+01		1	50			1.0E-03	5.1E-01	1.0E+00	2.1E-01	2.9E-03	1		
Mephosfolan	950-10-7	2.7E+02	O	1.2E-10	4.9E-09	No	0	4.6E-02	5.3E-06	6.4E+02		1.3E+00	1.3E+00	5.7E+01	5.7E+04			7.8E+01	1.5E+00	0.1	1			2.4E-04		8.1E+00	1.0E+00	3.4E+00	1.5E-03	1		Yes
Mepiquat chloride (Mepiquat)	24307-26-4	1.5E+02	O	4.3E-12	1.8E-10	No	0	6.7E-02	7.9E-06	6.6E+01		1.3E-01	1.3E-01	5.0E+05	5.0E+08			1.2E+05	3.3E-01	0.1	1			3.0E-06		1.7E+00	1.0E+00	7.2E-01	1.4E-05	1		No
Mercury and compounds	7487-94-7	2.7E+02	I			No	0							6.9E+04	6.9E+07						0.07	2	2		1.0E-03	8.4E+00	1.0E+00	3.5E+00	6.3E-03	1		Yes
Mercury (elemental)	7439-97-6	2.0E+02	I	8.6E-03	3.5E-01	No	1	3.1E-02	6.3E-06		5.2E+01	5.2E+01	5.2E+01	6.0E-02	6.0E+01	1.1E-05	3.5E+04	3.1E+00	5.2E+01		1	2	2		1.0E-03	3.4E+00	1.0E+00	1.4E+00	5.4E-03	1		Yes
Mercury (methyl)	22967-92-6	2.2E+02	O			No	0														1			1.0E-03		4.1E+00	1.0E+00	1.7E+00	5.7E-03	1		Yes
Merphos	150-50-5	3.0E+02	O	2.3E-05	9.3E-04	No	1	2.0E-02	5.0E-06	4.9E+04		9.8E+01	9.8E+01	3.5E-03	3.5E+00	1.1E-08	1.9E+06	3.4E-01	9.8E+01		1			4.2E+00		2.3E+01	3.0E-01	4.9E+00	2.8E+01	1		No
Merphos oxide	78-48-8	3.1E+02	O	2.9E-07	1.2E-05	No	0	2.0E-02	5.0E-06	2.4E+03		4.7E+00	4.7E+00	2.3E+00	2.3E+03			1.1E+01	4.9E+00	0.1	1			1.7E-01		2.4E+01	9.0E-01	6.1E+00	1.1E+00	1		Yes
Metalaxyl	57837-19-1	2.8E+02	O	3.0E-09	1.2E-07	No	0	4.4E-02	5.2E-06	3.9E+01		7.7E-02	7.7E-02	8.4E+03	8.4E+06			1.5E+03	2.8E-01	0.1	1			5.8E-04		9.3E+00	1.0E+00	3.9E+00	3.7E-03	1		Yes
Methacrylonitrile	126-98-7	6.7E+01	O	2.5E-04	1.0E-02	Yes	1	9.6E-02	1.1E-05	1.3E+01		2.6E-02	2.6E-02	2.5E+04	2.5E+07	4.1E-04	6.8E+03	3.3E+03	2.3E-01		1			1.9E-03		6.0E-01	1.0E+00	2.5E-01	5.9E-03	1		Yes
Methamidophos	10265-92-6	1.4E+02	O	8.7E-10	3.5E-08	No	0	6.0E-02	9.2E-06	5.4E+00		1.1E-02	1.1E-02	1.0E+06	1.0E+09			1.1E+05	2.1E-01	0.1	1			7.4E-05		1.6E+00	1.0E+00	6.5E-01	3.4E-04	1		Yes
Methanol	67-56-1	3.2E+01	O	4.6E-06	1.9E-04	Yes	1	1.6E-01	1.7E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09	1.6E-05	2.9E+04	1.0E+05	2.0E-01		1			3.2E-04		3.8E-01	1.0E+00	1.6E-01	6.9E-04	1		Yes
Methidathion	950-37-8	3.0E+02	O	7.2E-09	2.9E-07	No	0	4.2E-02	4.9E-06	2.1E+01		4.2E-02	4.2E-02	1.9E+02	1.9E+05			2.7E+01	2.4E-01	0.1	1			9.1E-04		1.2E+01	1.0E+00	5.2E+00	6.1E-03	1		Yes
Methomyl	16752-77-5	1.6E+02	O	2.0E-11	8.1E-10	No	0	4.8E-02	8.4E-06	1.0E+01		2.0E-02	2.0E-02	5.8E+04	5.8E+07			7.0E+03	2.2E-01	0.1	1			4.8E-04		2.0E+00	1.0E+00	8.5E-01	2.4E-03	1		Yes
Methoxychlor	72-43-5	3.5E+02	O	2.0E-07	8.3E-06	No	0	2.2E-02	5.6E-06	2.7E+04		5.4E+01	5.4E+01	1.0E-01	1.0E+02			5.4E+00	5.4E+01	0.1	1	40	40	4.3E-02		2.2E+01	8.0E-01	9.1E+00	3.1E-01	1		Yes
2-Methoxyethanol	109-86-4	7.6E+01	O	3.3E-07	1.4E-05	Yes	1	9.5E-02	1.1E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09	1.4E-06	1.0E+05	1.0E+05	2.0E-01		1			1.8E-04		6.7E-01	1.0E+00	2.8E-01	6.0E-04	1		Yes
2-Methoxyethanol acetate	110-49-6	1.2E+02	O	3.1E-07	1.3E-05	Yes	1	6.6E-02	8.7E-06	2.5E+00		5.0E-03	5.0E-03	1.0E+06	1.0E+09	9.5E-07	1.2E+05	1.0E+05	2.0E-01		1			4.0E-04		1.2E+00	1.0E+00	4.8E-01	1.7E-03	1		Yes
2-Methoxy-5-nitroaniline	99-59-2	1.7E+02	O	1.3E-08	5.1E-07	No	0	4.3E-02	7.8E-06	7.1E+01		1.4E-01	1.4E-01	1.2E+02	1.2E+05			2.8E+01	3.4E-01	0.1	1			1.7E-03		2.2E+00	1.0E+00	9.2E-01	8.4E-03	1		Yes
Methyl acetate	79-20-9	7.4E+01	O	1.2E-04	4.7E-03	Yes	1	9.6E-02	1.1E-05	3.1E+00		6.1E-03	6.1E-03	2.4E+05	2.4E+08	2.2E-04	8.1E+03	2.6E+04	2.1E-01		1			7.9E-04		6.6E-01	1.0E+00	2.7E-01	2.6E-03	1		Yes
Methyl acrylate	96-33-3	8.6E+01	O	2.0E-04	8.1E-03	Yes	1	8.6E-02	1.0E-05	5.8E+00		1.2E-02	1.2E-02	4.9E+04	4.9E+07	3.3E-04	7.0E+03	5.6E+03	2.1E-01		1			1.8E-03		7.7E-01	1.0E+00	3.2E-01	6.2E-03	1		Yes
2-Methylaniline hydrochloride	636-21-5	1.4E+02	O	2.1E-06	8.6E-05	No	0	6.9E-02	8.1E-06	1.2E+02		2.3E-01	2.3E-01	8.3E+03	8.3E+06			2.7E+03	4.3E-01	0.1	1			1.1E-05		1.6E+00	1.0E+00	6.7E-01	4.8E-05	1		Yes
Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	17804-35-2	2.9E+02	O	4.9E-12	2.0E-10	No	0	4.3E-02	5.1E-06	3.4E+02		6.7E-01	6.7E-01	3.8E+00	3.8E+03			2.9E+00	8.7E-01	0.1	1			9.4E-04		1.1E+01	1.0E+00	4.4E+00	6.2E-03	1		Yes
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	94-74-6	2.0E+02	O	1.3E-09	5.4E-08	No	0	3.1E-02	8.2E-06	3.0E+01		5.9E-02	5.9E-02	6.3E+02	6.3E+05			1.0E+02	2.6E-01	0.1	1			1.7E-02		3.4E+00	1.0E+00	1.4E+00	9.2E-02	1		Yes
4-(2-Methyl-4-chlorophenoxy) butyric acid (MCPB)	94-81-5	2.3E+02	O	2.7E-09	1.1E-07	No	0	5.1E-02	5.9E-06	9.8E+01		2.0E-01	2.0E-01	4.8E+01	4.8E+04			1.4E+01	4.0E-01	0.1	1			1.7E-02		4.8E+00	9.0E-01	2.0E+00	1.0E-01	1		Yes
2-(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)	93-65-2	2.1E+02	O	1.8E-08	7.4E-07	No	0	2.7E-02	7.0E-06	4.9E+01		9.7E-02	9.7E-02	6.2E+02	6.2E+05			1.2E+02	3.0E-01	0.1	1			1.3E-02		4.0E+00	1.0E+00	1.7E+00	7.4E-02	1		Yes
4,4'-Methylenebisbenzeneamine	101-77-9	2.0E+02	O	5.3E-11	2.2E-09	No	0	5.6E-02	6.5E-06	2.1E+03		4.3E+00	4.3E+00	1.0E+03	1.0E+06			4.4E+03	4.5E+00	0.1	1			1.4E-03		3.3E+00	1.0E+00	1.4E+00	7.5E-03	1		Yes
4,4'-Methylene bis(2-chloroaniline)	101-14-4	2.7E+02	O	4.1E-11	1.7E-09	No	0	4.6E-02	5.4E-06	5.7E+03		1.1E+01	1.1E+01	1.4E+01	1.4E+04			1.6E+02	1.2E+01	0.1	1			2.0E-02		7.9E+00	9.0E-01	3.3E+00	1.2E-01	1	M	Yes
4,4'-Methylene bis(N,N'-dimethyl)aniline	101-61-1	2.5E+02	O	1.1E-09	4.4E-08	No	0	4.7E-02	5.5E-06	2.7E+03		5.3E+00	5.3E+00	4.1E+00	4.1E+03			2.2E+01	5.5E+00	0.1	1			8.4E-02		6.7E+00	1.0E+00	2.8E+00	5.2E-01	1		Yes
Methylene bromide	74-95-3	1.7E+02	O	8.2E-04	3.4E-02	Yes	1	5.5E-02	1.2E-05	2.2E+01		4.3E-02	4.3E-02	1.2E+04	1.2E+07	6.6E-04	5.6E+03	1.8E+03	2.5E-01		1			2.2E-03		2.4E+00	1.0E+00	9.9E-01	1.1E-02	1		Yes
Methylene chloride	75-09-2	8.5E+01	O	3.3E-03	1.3E-01	Yes	1	1.0E-01	1.3E-05	2.2E+01		4.3E-02	4.3E-02	1.3E+04	1.3E+07	4.2E-03	2.2E+03	2.2E+03	2.6E-01		1	5	5	3.5E-03		7.5E-01	1.0E+00	3.1E-01	1.3E-02	1	M	Yes
4,4'-Methylenediphenyl isocyanate	101-68-8	2.5E+02	O	9.0E-07	3.7E-05	No	0	2.4E-02	6.2E-06	2.8E+05		5.7E+02	5.7E+02	8.3E-01	8.3E+02			4.7E+02	5.7E+02	0.1	1			1.8E-01		1.0E+01	9.0E-01	2.7E+00	1.1E+00	1		Yes
2-(1-Methylethoxy)phenol methylcarbamate (Baygon)	114-26-1	2.1E+02	O	1.4E-09	5.8E-08	No	0	2.6E-02	6.6E-06	6.0E+01		1.2E-01	1.2E-01	1.9E+03	1.9E+06			4.1E+02	3.2E-01	0.1	1			1.1E-03		3.7E+00	1.0E+00	1.6E+00	6.0E-03	1		Yes
Methyl ethyl ketone (2-Butanone)	78-93-3	7.2E+01	O	5.7E-05	2.3E-03	Yes	1	9.1E-02	1.0E-05	4.5E+00		9.0E-03	9.0E-03	2.2E+05	2.2E+08	1.0E-04	1.2E+04	2.4E+04	2.1E-01		1			9.6E-04		6.4E-01	1.0E+00	2.7E-01	3.1E-03	1		Yes
Methyl isobutyl ketone (4-Methyl-2-pentanone)	108-10-1	1.0E+02	O	1.4E-04	5.6E-03	Yes	1	7.0E-02	8.3E-06	1.3E+01		2.5E-02	2.5E-02	1.9E+04	1.9E+07	1.7E-04	1.1E+04	2.4E+03	2.3E-01		1			3.2E-03		9.2E-01	1.0E+00	3.8E-01	1.2E-02	1		Yes
Methyl methacrylate	80-62-6	1.0E+02	O	3.2E-04	1.3E-02	Yes	1	7.5E-02	9.2E-06	9.1E+00		1.8E-02	1.8E-02	1.5E+04	1.5E+07	4.3E-04	6.3E+03	1.8E+03	2.2E-01		1			3.6E-03		9.2E-01	1.0E+00	3.8E-01	1.4E-02	1		Yes
2-Methyl-5-nitroaniline	99-55-8	1.5E+02	O	8.3E-09	3.4E-07	No	0	6.7E-02	7.8E-06	1.8E+02		3.6E-01	3.6E-01	1.0E+04	1.0E+07			4.6E+03	5.6E-01	0.1	1			3.8E-03		1.8E+00	1.0E+00	7.5E-01	1.8E-02	1		Yes
Methyl parathion	298-00-0	2.6E+02	O	1.0E-07	4.1E-06	No	0	2.5E-02	6.4E-06	7.3E+02		1.5E+00	1.5E+00	3.8E+01	3.8E+04			5.9E+01	1.7E+00	0.1	1			4.2E-03		7.5E+00	1.0E+00	3.1E+00	2.6E-02	1		Yes
2-Methylphenol	95-48-7	1.1E+02	O	1.2E-06	4.9E-05	No	0	7.3E-02	9.3E-06	3.1E+02		6.1E-01	6.1E-01	2.6E+04	2.6E+07			1.8E+04	8.1E-01	0.1	1			7.7E-03		1.0E+00	1.0E+00	4.2E-01	3.1E-02	1		Yes
3-Methylphenol	108-39-4	1.1E+02	O	8.6E-07	3.5E-05	No	0	7.3E-02	9.3E-06	3.0E+02		6.0E-01	6.0E-01	2.3E+04	2.3E+07			1.6E+04	8.0E-01	0.1	1			7.8E-03		1.0E+00	1.0E+00	4.2E-01	3.1E-02	1		Yes
4-Methylphenol	106-44-5	1.1E+02	O	1.0E-06	4.1E-05	No	0	7.2E-02	9.2E-06	3.0E+02		6.0E-01	6.0E-01	2.2E+04	2.2E+07			1.5E+04	8.0E-01	0.1	1			7.5E-03		1.0E+00	1.0E+00	4.2E-01	3.0E-02	1		Yes
Methyl phosphonic acid	993-13-5	9.6E+01	O	1.2E-11	5.0E-10	No	0	9.1E-02	1.1E-05	1.4E+00		2.8E-03	2.8E-03	2.0E+04	2.0E+07			2.1E+03	2.0E-01	0.1	1			9.8E-05		8.7E-01	1.0E+00	3.6E-01	3.7E-04	1		Yes
Methyl styrene (mixture)	25013-15-4	3.5E+02	O	2.6E-03	1.1E-01	Yes	1	1.7E-02	4.2E-06	7.2E+02		1.4E+00	1.4E+00	8.9E+01	8.9E+04	6.4E-05	2.4E+04	1.4E+02	1.6E+00		1			6.6E-02		2.4E+01	8.0E-01	1.0E+01	4.8E-01	1		Yes
Methyl styrene (alpha)	98-83-9	1.2E+02	O	2.6E-03	1.0E-01	Yes	1	6.3E-02	8.2E-06	7.0E+02		1.4E+00	1.4E+00	1.2E+02	1.2E+05	2.3E-04	1.3E+04	1.8E+02	1.6E+00		1			7.0E-02		1.2E+00	1.0E+00	4.8E-01	2.9E-01	1		Yes
Methyl tertbutyl ether (MTBE)	1634-04-4	8.8E+01	O	5.9E-04	2.4E-02	Yes	1	7.5E-02	8.6E-06	1.2E+01		2.3E-02	2.3E-02	5.1E+04	5.1E+07	7.5E-04	4.9E+03	6.5E+03	2.3E-01		1			2.1E-03		7.9E-01	1.0E+00	3.3E-01	7.6E-03	1		Yes
Metolaclor (Dual)	51218-45-2	2.8E+02	O	9.0E-09	3.7E-07	No	0	2.2E-02	5.5E-06	4.9E+02		9.8E-01	9.8E-01	5.3E+02	5.3E+05			5.7E+02	1.2E+00	0.1	1			3.4E-03		9.8E+00	1.0E+00	4.1E+00	2.2E-02	1		Yes
Metribuzin	21087-64-9	2.1E+02	O	1.2E-10	4.8E-09	No	0	2.7E-02	7.1E-06	5.3E+01		1.1E-01	1.1E-01	1.1E+03	1.1E+06			2.2E+02	3.1E-01	0.1	1			1.3E-03		4.0E+00	1.0E+00	1.7E+00	7.4E-03	1		Yes
Metsulfuron-methyl (Ally)	74223-64-6	3.8E+02	O	1.3E-16	5.4E-15	No	0	3.6E-02	4.2E-06	9.3E+01		1.9E-01	1.9E-01	9.5E+03	9.5E+06			2.7E+03	3.9E-01	0.1	1			3.3E-04		3.4E+01	1.0E+00	1.4E+01	2.5E-03	1		Yes
Mirex	2385-85-5	5.5E+02	O	8.1E-04	3.3E-02	No	1	2.2E-02	5.6E-06	3.6E+05		7.1E+02	7.1E+02	8.5E-02	8.5E+01	5.4E-08	8.6E+05	6.1E+01	7.1E+02		1			5.2E-02		2.9E+02	5.0E-01	1.2E+02	4.6E-01	1		No
Molinate	2212-67-1	1.9E+02	O	4.1E-06	1.7E-04	No	0	3.2E-02	6.8E-06	1.8E+02		3.6E-01	3.6E-01	9.7E+02	9.7E+05			4.5E+02	5.6E-01	0.1	1			1.9E-02		2.8E+00	1.0E+00	1.2E+00	9.9E-02	1		Yes
Molybdenum	7439-98-7	9.6E+01	O			No	0				2.0E+01	2.0E+01	2.0E+01						2.0E+01		1			1.0E-03		8.7E-01	1.0E+00	3.6E-01	3.8E-03	1		Yes
Monochloramine	10599-90-3	5.1E+01	O			No	0														1		4000	1.0E-03		4.9E-01	1.0E+00	2.0E-01	2.8E-03	1		Yes
Myclobutanil (Systhane)	88671-89-0	2.7E+02	O	4.3E-09	1.7E-07	No	0	4.5E-02	5.3E-06	6.1E+03		1.2E+01	1.2E+01	1.4E+02	1.4E+05			1.7E+03	1.2E+01	0.1	1			3.4E-03		8.7E+00	1.0E+00	3.6E+00	2.1E-02	1		Yes
Naled	300-76-5	3.8E+02	O	6.5E-05	2.7E-03	No	1	2.5E-02	6.4E-06	1.3E+02		2.5E-01	2.5E-01	1.5E+00	1.5E+03	1.0E-05	5.7E+04	5.3E-01	4.5E-01		1			9.4E-05		3.4E+01	1.0E+00	1.4E+01	7.1E-04	1		Yes
Napropamide	15299-99-7	2.7E+02	O	8.4E-10	3.4E-08	No	0	4.5E-02	5.3E-06	3.2E+03		6.4E+00	6.4E+00	7.3E+01	7.3E+04			4.8E+02	6.6E+00	0.1	1			8.0E-03		8.3E+00	9.0E-01	3.5E+00	5.1E-02	1		Yes
Nickel and compounds	7440-02-0	5.9E+01	I			No	0				6.5E+01	6.5E+01	6.5E+01						6.5E+01		0.04				2.0E-04	5.4E-01	1.0E+00	2.2E-01	5.9E-04	1		Yes
Nickel refinery dust	7440-02-0-NRD		I			No	0				1.5E+02	1.5E+02	1.5E+02						1.5E+02		0.04				2.0E-04		0.0E+00			1		Yes
Nickel subsulfide	12035-72-2	2.4E+02	I			No	0														0.04				2.0E-04	5.6E+00	1.0E+00	2.3E+00	1.2E-03	1		Yes
Nitrate	14797-55-8	6.2E+01	I			No	0														1	10000	10000		1.0E-03	5.6E-01	1.0E+00	2.3E-01	3.0E-03	1		Yes
Nitrite	14797-65-0	4.7E+01	I			No	0														1	1000	1000		1.0E-03	4.6E-01	1.0E+00	1.9E-01	2.6E-03	1		Yes
2-Nitroaniline	88-74-4	1.4E+02	O	5.9E-08	2.4E-06	No	0	5.2E-02	7.4E-06	1.1E+02		2.2E-01	2.2E-01	1.5E+03	1.5E+06			4.7E+02	4.2E-01	0.1	1			4.5E-03		1.5E+00	1.0E+00	6.2E-01	2.0E-02	1		Yes
Nitrobenzene	98-95-3	1.2E+02	O	2.4E-05	9.8E-04	No	1	6.8E-02	9.4E-06	2.3E+02		4.5E-01	4.5E-01	2.1E+03	2.1E+06	6.5E-06	7.3E+04	1.2E+03	6.5E-01		1			5.4E-03		1.2E+00	1.0E+00	5.1E-01	2.3E-02	1		Yes
Nitrofurantoin	67-20-9	2.4E+02	O	1.3E-12	5.4E-11	No	0	4.9E-02	5.8E-06	1.2E+02		2.3E-01	2.3E-01	8.0E+01	8.0E+04			2.7E+01	4.3E-01	0.1	1			3.5E-05		5.4E+00	1.0E+00	2.3E+00	2.1E-04	1		Yes
Nitrofurazone	59-87-0	2.0E+02	O	3.1E-13	1.3E-11	No	0	5.6E-02	6.5E-06	3.5E+02		7.0E-01	7.0E-01	2.1E+02	2.1E+05			1.7E+02	9.0E-01	0.1	1			1.7E-04		3.2E+00	1.0E+00	1.4E+00	9.3E-04	1		Yes
Nitroglycerin	55-63-0	2.3E+02	O	8.7E-08	3.5E-06	No	0	2.9E-02	7.7E-06	1.2E+02		2.3E-01	2.3E-01	1.4E+03	1.4E+06			4.6E+02	4.3E-01	0.1	1			9.9E-04		4.7E+00	1.0E+00	2.0E+00	5.8E-03	1		Yes
Nitroguanidine	556-88-7	1.0E+02	O	4.5E-16	1.8E-14	No	0	1.0E-01	1.4E-05	2.1E+01		4.1E-02	4.1E-02	4.4E+03	4.4E+06			6.2E+02	2.4E-01	0.1	1			1.1E-04		9.7E-01	1.0E+00	4.0E-01	4.1E-04	1		Yes
2-Nitropropane	79-46-9	8.9E+01	O	1.2E-04	4.9E-03	Yes	1	8.5E-02	1.0E-05	3.1E+01		6.2E-02	6.2E-02	1.7E+04	1.7E+07	1.4E-04	1.3E+04	2.8E+03	2.6E-01		1			2.1E-03		8.0E-01	1.0E+00	3.3E-01	7.5E-03	1		Yes
N-Nitrosodi-n-butylamine	924-16-3	1.6E+02	O	1.3E-05	5.4E-04	No	1	4.2E-02	6.8E-06	9.1E+02		1.8E+00	1.8E+00	1.3E+03	1.3E+06	6.5E-07	2.4E+05	2.5E+03	2.0E+00		1			1.1E-02		1.9E+00	1.0E+00	8.1E-01	5.5E-02	1		Yes
N-Nitrosodiethanolamine	1116-54-7	1.3E+02	O	4.9E-12	2.0E-10	No	0	7.3E-02	8.5E-06	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09			1.0E+05	2.0E-01	0.1	1			2.5E-05		1.4E+00	1.0E+00	5.9E-01	1.1E-04	1		Yes
N-Nitrosodiethylamine	55-18-5	1.0E+02	O	3.6E-06	1.5E-04	No	0	7.4E-02	9.1E-06	8.3E+01		1.7E-01	1.7E-01	1.1E+05	1.1E+08			2.8E+04	3.7E-01	0.1	1			8.7E-04		9.4E-01	1.0E+00	3.9E-01	3.4E-03	1	M	Yes
N-Nitrosodimethylamine	62-75-9	7.4E+01	O	1.8E-06	7.4E-05	Yes	1	9.9E-02	1.2E-05	2.3E+01		4.6E-02	4.6E-02	1.0E+06	1.0E+09	3.2E-06	8.2E+04	1.5E+05	2.5E-01		1			2.5E-04		6.6E-01	1.0E+00	2.7E-01	8.3E-04	1	M	Yes
N-Nitrosodiphenylamine	86-30-6	2.0E+02	O	1.2E-06	5.0E-05	No	0	5.6E-02	6.5E-06	2.6E+03		5.3E+00	5.3E+00	3.5E+01	3.5E+04			1.9E+02	5.5E+00	0.1	1			1.5E-02		3.3E+00	1.0E+00	1.4E+00	7.9E-02	1		Yes
N-Nitroso di-n-propylamine	621-64-7	1.3E+02	O	5.4E-06	2.2E-04	No	0	5.6E-02	7.8E-06	2.8E+02		5.5E-01	5.5E-01	1.3E+04	1.3E+07			8.5E+03	7.5E-01	0.1	1			2.3E-03		1.4E+00	1.0E+00	5.6E-01	1.0E-02	1		Yes
N-Nitroso-N-methylethylamine	10595-95-6	8.8E+01	O	1.4E-06	5.9E-05	Yes	1	8.4E-02	1.0E-05	4.3E+01		8.7E-02	8.7E-02	3.0E+05	3.0E+08	1.8E-06	1.2E+05	5.6E+04	2.9E-01		1			5.3E-04		7.9E-01	1.0E+00	3.3E-01	1.9E-03	1		Yes
N-Nitrosopyrrolidine	930-55-2	1.0E+02	O	4.9E-08	2.0E-06	No	0	8.0E-02	1.0E-05	9.2E+01		1.8E-01	1.8E-01	1.0E+06	1.0E+09			2.8E+05	3.8E-01	0.1	1			3.2E-04		9.2E-01	1.0E+00	3.8E-01	1.2E-03	1		Yes
m-Nitrotoluene	99-08-1	1.4E+02	O	9.3E-06	3.8E-04	No	0	5.9E-02	8.7E-06	3.6E+02		7.3E-01	7.3E-01	5.0E+02	5.0E+05			4.1E+02	9.3E-01	0.1	1			1.1E-02		1.5E+00	1.0E+00	6.2E-01	5.1E-02	1		Yes
o-Nitrotoluene	88-72-2	1.4E+02	O	1.3E-05	5.1E-04	No	1	5.9E-02	8.7E-06	3.7E+02		7.4E-01	7.4E-01	6.5E+02	6.5E+05	2.0E-06	1.4E+05	5.5E+02	9.4E-01		1			9.0E-03		1.5E+00	1.0E+00	6.2E-01	4.0E-02	1		Yes
p-Nitrotoluene	99-99-0	1.4E+02	O	5.6E-06	2.3E-04	No	0	5.7E-02	8.4E-06	3.6E+02		7.3E-01	7.3E-01	4.4E+02	4.4E+05			3.7E+02	9.3E-01	0.1	1			1.0E-02		1.5E+00	1.0E+00	6.2E-01	4.5E-02	1		Yes

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-2: CHEMICAL-SPECIFIC PARAMETERS

Contaminant		CAS	MW (g/mol)	Organic/ Inorganic	Henry's Law Constant H_units (atm-m^3/mol)	Henry's Law Constant H' (H_unitless) (unitless)	VP>1?	VOL	D_i (cm^2/s)	D_w (cm^2/s)	K_{oc} (organics) (cm^3/g)	K_d (inorganics) (cm^3/g)	$K_{d\ VF}$ (cm^3/g)	K_d_s_to_gw (cm^3/g)	S (mg/L-water)	S (µg/L-water)	D_A (cm^2/s)	VF (m^3/kg)	SAT (mg/kg)	soil-to-gw factor (kg/L)	ABS_d	ABS_{GI}	Title 118 MCL (µg/L)	EPA Fed MCL MCL (µg/L)	Kp.org (cm/hr)	Kp.inorg (cm/hr)	t_star (hr)	FA (unitless)	tau_event (hr)	B (unitless)	RBA (unitless)	Mutagen	In EPD?
Norflurazon		27314-13-2	3.0E+02	O	3.4E-10	1.4E-08	No	0	4.2E-02	4.9E-06	3.1E+03		6.2E+00	6.2E+00	3.4E+01	3.4E+04			2.1E+02	6.4E+00	0.1	1			1.1E-03		1.3E+01	1.0E+00	5.3E+00	7.0E-03	1		Yes
Octabromodiphenyl ether		32536-52-0	8.0E+02	O	7.5E-08	3.1E-06	No	0	2.2E-02	2.6E-06	9.9E+04		2.0E+02	2.0E+02	1.1E-08	1.1E-05			2.2E-06	2.0E+02	0.1	1			3.1E-02		7.8E+03	3.0E-01	3.2E+03	3.3E-01	1		No
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)		2691-41-0	3.0E+02	O	8.7E-10	3.5E-08	No	0	4.3E-02	5.0E-06	5.3E+02		1.1E+00	1.1E+00	5.0E+00	5.0E+03			5.8E+00	1.3E+00	0.006	1			4.4E-05		1.1E+01	1.0E+00	4.8E+00	2.9E-04	1		Yes
Octamethylpyrophosphoramide		152-16-9	2.9E+02	O	3.8E-10	1.5E-08	No	0	2.2E-02	5.4E-06	2.0E+01		4.0E-02	4.0E-02	1.0E+06	1.0E+09			1.4E+05	2.4E-01	0.1	1			8.3E-06		1.0E+01	1.0E+00	4.2E+00	5.4E-05	1		Yes
Oryzalin		19044-88-3	3.5E+02	O	1.9E-09	7.8E-08	No	0	3.9E-02	4.5E-06	8.3E+02		1.7E+00	1.7E+00	2.5E+00	2.5E+03			4.4E+00	1.9E+00	0.1	1			5.4E-03		2.2E+01	9.0E-01	9.2E+00	3.8E-02	1		Yes
Oxadiazon		19666-30-9	3.5E+02	O	7.3E-08	3.0E-06	No	0	3.9E-02	4.5E-06	5.0E+03		1.0E+01	1.0E+01	7.0E-01	7.0E+02			7.1E+00	1.0E+01	0.1	1			2.8E-02		2.2E+01	8.0E-01	9.0E+00	2.0E-01	1		Yes
Oxamyl		23135-22-0	2.2E+02	O	2.4E-10	9.7E-09	No	0	2.3E-02	5.9E-06	1.0E+01		2.0E-02	2.0E-02	2.8E+05	2.8E+08			3.4E+04	2.2E-01	0.1	1	200	200	4.5E-05		4.3E+00	1.0E+00	1.8E+00	2.6E-04	1		Yes
Oxyfluorfen		42874-03-3	3.6E+02	O	8.2E-07	3.4E-05	No	0	2.1E-02	5.3E-06	4.0E+04		8.0E+01	8.0E+01	1.2E-01	1.2E+02			9.3E+00	8.0E+01	0.1	1			2.0E-02		2.7E+01	8.0E-01	1.1E+01	1.5E-01	1		Yes
Paclobutrazol		76738-62-0	2.9E+02	O	8.3E-11	3.4E-09	No	0	2.2E-02	5.7E-06	9.2E+02		1.8E+00	1.8E+00	2.6E+01	2.6E+04			5.1E+01	2.0E+00	0.1	1			4.7E-03		1.1E+01	9.0E-01	4.6E+00	3.1E-02	1		Yes
Paraquat		4685-14-7	1.9E+02	O	1.0E-09	2.4E-11	No	0	4.7E-02	5.5E-06	6.8E+03		1.4E+01	1.4E+01	6.2E+05	6.2E+08			8.5E+06	1.6E+01	0.1	1			5.8E-08		7.0E+00	1.0E+00	2.9E+00	3.6E-07	1		No
Parathion		56-38-2	2.9E+02	O	3.0E-07	1.2E-05	No	0	2.3E-02	5.8E-06	2.4E+03		4.8E+00	4.8E+00	1.1E+01	1.1E+04			5.4E+01	5.0E+00	0.1	1			1.3E-02		1.1E+01	9.0E-01	4.5E+00	8.4E-02	1		Yes
Pebulate		1114-71-2	2.0E+02	O	2.4E-04	9.7E-03	No	1	2.4E-02	6.1E-06	3.0E+02		6.0E-01	6.0E-01	1.0E+02	1.0E+05	1.8E-05	4.5E+04	7.0E+01	8.0E-01		1			4.0E-02		3.5E+00	1.0E+00	1.4E+00	2.2E-01	1		Yes
Pendimethalin		40487-42-1	2.8E+02	O	8.6E-07	3.5E-05	No	0	2.3E-02	5.7E-06	5.6E+03		1.1E+01	1.1E+01	3.3E-01	3.3E+02			3.7E+00	1.1E+01	0.1	1			1.2E-01		1.5E+01	9.0E-01	4.0E+00	7.4E-01	1		Yes
Pentabromo-6-chloro cyclohexane		87-84-3	5.1E+02	O	9.6E-07	3.9E-05	No	0	3.0E-02	3.5E-06	2.8E+03		5.6E+00	5.6E+00	5.5E-02	5.5E+01			3.1E-01	5.8E+00	0.1	1			2.8E-03		1.9E+02	9.0E-01	7.9E+01	2.5E-02	1		Yes
Pentabromodiphenyl ether		32534-81-9	5.6E+02	O	1.1E-04	4.4E-03	No	1	2.8E-02	3.2E-06	2.2E+04		4.3E+01	4.3E+01	2.4E-03	2.4E+00	1.5E-07	5.1E+05	1.0E-01	4.4E+01		1			3.7E-02		3.7E+02	6.0E-01	1.5E+02	3.4E-01	1		No
Pentachlorobenzene		608-93-5	2.5E+02	O	7.0E-04	2.9E-02	No	1	2.9E-02	7.9E-06	3.7E+03		7.4E+00	7.4E+00	8.3E-01	8.3E+02	6.0E-06	8.1E+04	6.3E+00	7.6E+00		1			1.7E-01		1.0E+01	9.0E-01	2.7E+00	1.0E+00	1		Yes
Pentachloronitrobenzene		82-68-8	3.0E+02	O	4.4E-05	1.8E-03	No	1	2.6E-02	6.9E-06	6.0E+03		1.2E+01	1.2E+01	4.4E-01	4.4E+02	2.1E-07	4.3E+05	5.3E+00	1.2E+01		1			4.2E-02		1.1E+01	9.0E-01	4.7E+00	2.8E-01	1		Yes
Pentachlorophenol		87-86-5	2.7E+02	O	2.5E-08	1.0E-06	No	0	3.0E-02	8.0E-06	5.9E+02		1.2E+00	1.2E+00	1.4E+01	1.4E+04			1.8E+01	1.4E+00	0.25	1	1	1	1.3E-01		1.3E+01	9.0E-01	3.3E+00	8.0E-01	1		Yes
Perchlorate		14797-73-0	1.2E+02	I			No	0							2.5E+05	2.5E+08						1		15		1.0E-03	1.1E+00	1.0E+00	4.8E-01	4.2E-03	1		Yes
Perfluoroalkyl Compounds																																	
Perfluoro-octanesulfonate (PFOS)^^		1763-23-1	3.0E+02	O	1.4E-05	5.9E-04	No	0	2.7E-02	7.2E-06	1.8E+02		3.5E-01	3.5E-01	3.7E+02	3.7E+05			1.7E+02	5.5E-01	0.1	1	0.07		1.3E-03		1.2E+01	0.0E+00	5.0E+00	8.7E-03	1		Yes
Perfluorooctanoic acid (PFOA)^^	1	335-67-1	2.1E+02	O	2.0E-04	8.2E-03	No	0			1.1E+02			2.3E-01	9.5E+03	9.5E+06				4.3E-01	0.1	1	0.07		1.3E-03		1.2E+01	0.0E+00	5.0E+00	8.7E-03	1		Yes
Permethrin		52645-53-1	3.0E+02	O	1.9E-06	7.7E-05	No	0	1.9E-02	4.8E-06	1.2E+05		2.4E+02	2.4E+02	6.0E-03	6.0E+00			1.4E+00	2.4E+02	0.1	1			2.1E-01		6.5E+01	6.0E-01	1.6E+01	1.6E+00	1		No
Phenmedipham		13684-63-4	2.1E+02	O	8.4E-13	3.4E-11	No	0	4.2E-02	5.0E-06	2.6E+03		5.2E+00	5.2E+00	4.7E+00	4.7E+03			2.5E+01	5.4E+00	0.1	1			7.9E-03		1.2E+01	9.0E-01	5.1E+00	5.2E-02	1		Yes
Phenol		108-95-2	9.4E+01	O	3.3E-07	1.4E-05	No	0	8.3E-02	1.0E-05	1.9E+02		3.7E-01	3.7E-01	8.3E+04	8.3E+07			3.9E+04	5.7E-01	0.1	1			4.3E-03		8.5E-01	1.0E+00	3.5E-01	1.6E-02	1		Yes
m-Phenylenediamine		108-45-2	1.1E+02	O	1.3E-09	5.1E-08	No	0	7.2E-02	9.2E-06	3.4E+01		6.8E-02	6.8E-02	2.4E+05	2.4E+08			4.0E+04	2.7E-01	0.1	1			2.3E-04		1.0E+00	1.0E+00	4.2E-01	9.4E-04	1		Yes
p-Phenylenediamine		106-50-3	1.1E+02	O	6.7E-10	2.8E-08	No	0	8.4E-02	9.8E-06	3.4E+01		6.8E-02	6.8E-02	3.7E+04	3.7E+07			6.2E+03	2.7E-01	0.1	1			2.5E-04		1.0E+00	1.0E+00	4.2E-01	9.8E-04	1		Yes
Phenylmercuric acetate		62-38-4	3.4E+02	O	5.7E-10	2.3E-08	No	0	3.9E-02	4.6E-06	5.6E+01		1.1E-01	1.1E-01	4.4E+03	4.4E+06			9.3E+02	3.1E-01	0.1	1			6.0E-05		1.9E+01	1.0E+00	8.1E+00	4.2E-04	1		Yes
2-Phenylphenol		90-43-7	1.7E+02	O	1.1E-06	4.3E-05	No	0	4.2E-02	7.8E-06	6.7E+03		1.3E+01	1.3E+01	7.0E+02	7.0E+05			9.5E+03	1.4E+01	0.1	1			2.0E-02		2.3E+00	1.0E+00	9.4E-01	9.8E-02	1		Yes
Phorate		298-02-2	2.6E+02	O	4.4E-06	1.8E-04	No	0	2.3E-02	5.9E-06	4.6E+02		9.2E-01	9.2E-01	5.0E+01	5.0E+04			5.1E+01	1.1E+00	0.1	1			1.3E-02		7.2E+00	9.0E-01	3.0E+00	7.8E-02	1		Yes
Phosmet		732-11-6	3.2E+02	O	8.4E-09	3.4E-07	No	0	4.1E-02	4.8E-06	1.0E+01		2.0E-02	2.0E-02	2.4E+01	2.4E+04			2.9E+00	2.2E-01	0.1	1			1.8E-03		1.5E+01	1.0E+00	6.3E+00	1.3E-02	1		Yes
Phosphine		7803-51-2	3.4E+01	O	2.4E-02	1.0E+00	Yes	1	1.9E-01	2.2E-05					2.6E+05	2.6E+08						1			1.0E-03		3.9E-01	1.0E+00	1.6E-01	2.2E-03	1		Yes
Phosphoric acid		7664-38-2	9.8E+01	O			No	0							5.5E+06	5.5E+09						1			1.0E-03		8.9E-01	1.0E+00	3.7E-01	3.8E-03	1		Yes
Phosphorus (white)		7723-14-0	3.1E+01	O	2.1E-03	8.6E-02	No	1	2.2E-01	2.8E-05	1.1E+03	3.5E+00		3.5E+00	3.0E+00	3.0E+03		6.9E+03		3.7E+00		1			1.0E-03		3.8E-01	1.0E+00	1.6E-01	2.1E-03	1		Yes
p-Phthalic acid		100-21-0	1.7E+02	O	3.9E-13	1.6E-11	No	0	4.9E-02	9.0E-06	7.9E+01		1.6E-01	1.6E-01	1.5E+01	1.5E+04			3.9E+00	3.6E-01	0.1	1			3.9E-03		2.1E+00	1.0E+00	9.0E-01	1.9E-02	1		Yes
Phthalic anhydride		85-44-9	1.5E+02	O	1.6E-08	6.7E-07	No	0	5.9E-02	9.8E-06	1.0E+01		2.0E-02	2.0E-02	6.2E+03	6.2E+06			7.4E+02	2.2E-01	0.1	1			2.7E-03		1.7E+00	1.0E+00	7.1E-01	1.2E-02	1		Yes
Picloram		1918-02-1	2.4E+02	O	5.3E-14	2.2E-12	No	0	4.9E-02	5.7E-06	3.9E+01		7.8E-02	7.8E-02	4.3E+02	4.3E+05			7.6E+01	2.8E-01	0.1	1	500	500	1.3E-03		5.7E+00	1.0E+00	2.4E+00	7.6E-03	1		Yes
Pirimiphos-methyl		29232-93-7	3.1E+02	O	7.0E-07	2.9E-05	No	0	2.2E-02	5.4E-06	3.7E+02		7.5E-01	7.5E-01	8.6E+00	8.6E+03			7.3E+00	9.5E-01	0.1	1			1.9E-02		1.3E+01	9.0E-01	5.4E+00	1.3E-01	1		Yes
Polybrominated biphenyls (PBBs)		59536-65-1		O			No	0													0.1	1						0.0E+00			1		No
Polychlorinated biphenyls (PCBs)		1336-36-3	2.9E+02	O	4.2E-04	1.7E-02	No	1	2.4E-02	6.3E-06	7.8E+04		1.6E+02	1.6E+02	7.0E-01	7.0E+02	1.4E-07	5.3E+05	1.1E+02	1.6E+02	0.14	1	0.5	0.5	5.5E-01		1.9E+01	7.0E-01	4.5E+00	3.6E+00	1		
Aroclor 1016		12674-11-2	6.3E+02	O			No	0																							1		
Aroclor 1221		11104-28-2	1.9E+02	O	2.3E-04	9.3E-03	No	1	3.2E-02	7.2E-06	8.4E+03		1.7E+01	1.7E+01	1.5E+01	1.5E+04	9.6E-07	2.0E+05	2.5E+02	1.7E+01	0.14	1			1.7E-01		4.6E+00	1.0E+00	1.2E+00	8.9E-01	1		Yes
Aroclor 1232		11141-16-5	1.9E+02	O	7.4E-04	3.0E-02	No	1	3.3E-02	7.5E-06	8.4E+03		1.7E+01	1.7E+01	1.5E+00	1.5E+03	3.2E-06	1.1E+05	2.5E+01	1.7E+01	0.14	1			1.7E-01		4.6E+00	1.0E+00	1.2E+00	8.9E-01	1		Yes
Aroclor 1242		53469-21-9	2.9E+02	O	3.4E-04	1.4E-02	No	1	2.4E-02	6.1E-06	7.8E+04		1.6E+02	1.6E+02	2.8E-01	2.8E+02	1.1E-07	5.9E+05	4.3E+01	1.6E+02	0.14	1			5.5E-01		1.9E+01	7.0E-01	4.5E+00	3.6E+00	1		No
Aroclor 1248		12672-29-6	6.2E+02	O	4.4E-04	1.8E-02	No	1	1.6E-02	3.9E-06	7.7E+04		1.5E+02	1.5E+02	1.0E-01	1.0E+02	1.0E-07	6.3E+05	1.5E+01	1.5E+02	0.14	1			4.8E-01		1.3E+03	0.0E+00	3.1E+02	4.5E+00	1		No
Aroclor 1254		11097-69-1	3.3E+02	O	2.8E-04	1.2E-02	No	1	2.4E-02	6.1E-06	1.3E+05		2.6E+02	2.6E+02	4.3E-02	4.3E+01	5.6E-08	8.4E+05	1.1E+01	2.6E+02	0.14	1			7.5E-01		3.1E+01	5.0E-01	7.1E+00	5.2E+00	1		No
Aroclor 1260		11096-82-5	4.0E+02	O	3.4E-04	1.4E-02	No	1	2.2E-02	5.6E-06	3.5E+05		7.0E+02	7.0E+02	1.4E-02	1.4E+01	2.3E-08	1.3E+06	1.0E+01	7.0E+02	0.14	1			9.9E-01		7.7E+01	0.0E+00	1.7E+01	7.5E+00	1		No
Polynuclear aromatic hydrocarbons (PAHs)																																	
Acenaphthene		83-32-9	1.5E+02	O	1.8E-04	7.5E-03	No	1	5.1E-02	8.3E-06	5.0E+03		1.0E+01	1.0E+01	3.9E+00	3.9E+03	2.0E-06	1.4E+05	4.0E+01	1.0E+01	0.13	1			8.6E-02		1.8E+00	1.0E+00	7.7E-01	4.1E-01	1		Yes
Anthracene		120-12-7	1.8E+02	O	5.6E-05	2.3E-03	No	1	3.9E-02	7.9E-06	1.6E+04		3.3E+01	3.3E+01	4.3E-02	4.3E+01	1.5E-07	5.2E+05	1.4E+00	3.3E+01	0.13	1			1.4E-01		4.1E+00	1.0E+00	1.0E+00	7.3E-01	1		Yes
Benz[a]anthracene		56-55-3	2.3E+02	O	1.2E-05	4.9E-04	No	1	2.6E-02	6.7E-06	1.8E+05		3.5E+02	3.5E+02	9.4E-03	9.4E+00	2.0E-09	4.4E+06	3.3E+00	3.5E+02	0.13	1			5.5E-01		8.5E+00	1.0E+00	2.0E+00	3.2E+00	1	M	No
Benzo[a]pyrene		50-32-8	2.5E+02	O	4.6E-07	1.9E-05	No	0	4.8E-02	5.6E-06	5.9E+05		1.2E+03	1.2E+03	1.6E-03	1.6E+00			1.9E+00	1.2E+03	0.13	1	0.2	0.2	7.1E-01		1.2E+01	1.0E+00	2.7E+00	4.4E+00	1	M	No
Benzo[b]fluoranthene		205-99-2	2.5E+02	O	6.6E-07	2.7E-05	No	0	4.8E-02	5.6E-06	6.0E+05		1.2E+03	1.2E+03	1.5E-03	1.5E+00			1.8E+00	1.2E+03	0.13	1			4.2E-01		1.1E+01	1.0E+00	2.7E+00	2.5E+00	1	M	No
Benzo[k]fluoranthene		207-08-9	2.5E+02	O	5.8E-07	2.4E-05	No	0	4.8E-02	5.6E-06	5.9E+05		1.2E+03	1.2E+03	8.0E-04	8.0E-01			9.4E-01	1.2E+03	0.13	1			6.9E-01		1.2E+01	9.0E-01	2.7E+00	4.2E+00	1	M	No
Chrysene		218-01-9	2.3E+02	O	5.2E-06	2.1E-04	No	0	2.6E-02	6.7E-06	1.8E+05		3.6E+02	3.6E+02	2.0E-03	2.0E+00			7.2E-01	3.6E+02	0.13	1			6.0E-01		8.5E+00	1.0E+00	2.0E+00	3.5E+00	1	M	No
Dibenz[ah]anthracene		53-70-3	2.8E+02	O	1.4E-07	5.8E-06	No	0	4.5E-02	5.2E-06	1.9E+06		3.8E+03	3.8E+03	2.5E-03	2.5E+00			9.5E+00	3.8E+03	0.13	1			9.5E-01		1.7E+01	6.0E-01	3.8E+00	6.1E+00	1	M	No
Fluoranthene		206-44-0	2.0E+02	O	8.9E-06	3.6E-04	No	0	2.8E-02	7.2E-06	5.5E+04		1.1E+02	1.1E+02	2.6E-01	2.6E+02			2.9E+01	1.1E+02	0.13	1			3.1E-01		5.7E+00	1.0E+00	1.4E+00	1.7E+00	1		No
Fluorene		86-73-7	1.7E+02	O	9.6E-05	3.9E-03	No	1	4.4E-02	7.9E-06	9.2E+03		1.8E+01	1.8E+01	1.7E+00	1.7E+03	5.0E-07	2.8E+05	3.1E+01	1.9E+01	0.13	1			1.1E-01		2.2E+00	1.0E+00	9.0E-01	5.5E-01	1		Yes
Indeno[1,2,3-cd]pyrene		193-39-5	2.8E+02	O	3.5E-07	1.4E-05	No	0	4.5E-02	5.2E-06	2.0E+06		3.9E+03	3.9E+03	1.9E-04	1.9E-01			7.4E-01	3.9E+03	0.13	1			1.2E+00		1.7E+01	6.0E-01	3.7E+00	7.9E+00	1	M	No
Naphthalene		91-20-3	1.3E+02	O	4.4E-04	1.8E-02	No	1	6.0E-02	8.4E-06	1.5E+03		3.1E+00	3.1E+00	3.1E+01	3.1E+04	1.8E-05	4.6E+04	9.9E+01	3.3E+00	0.13	1			4.7E-02		1.3E+00	1.0E+00	5.5E-01	2.0E-01	1		Yes
Pyrene		129-00-0	2.0E+02	O	1.2E-05	4.9E-04	No	1	2.8E-02	7.2E-06	5.4E+04		1.1E+02	1.1E+02	1.4E-01	1.4E+02	7.0E-09	2.4E+06	1.5E+01	1.1E+02	0.13	1			2.0E-01		5.5E+00	1.0E+00	1.4E+00	1.1E+00	1		Yes
Prochloraz		67747-09-5	3.8E+02	O	1.6E-08	6.7E-07	No	0	3.6E-02	4.3E-06	2.4E+03		4.9E+00	4.9E+00	3.4E+01	3.4E+04			1.7E+02	5.1E+00	0.1	1			6.4E-03		3.2E+01	9.0E-01	1.4E+01	4.8E-02	1		Yes
Profluralin		26399-36-0	3.5E+02	O	2.9E-04	1.2E-02	No	1	2.2E-02	5.5E-06	3.1E+04		6.1E+01	6.1E+01	1.0E-01	1.0E+02	2.3E-07	4.2E+05	6.1E+00	6.1E+01		1			9.0E-02		3.7E+01	8.0E-01	9.3E+00	6.5E-01	1		Yes
Prometon		1610-18-0	2.3E+02	O	9.1E-10	3.7E-08	No	0	5.1E-02	6.0E-06	1.4E+02		2.7E-01	2.7E-01	7.5E+02	7.5E+05			2.8E+02	4.7E-01	0.1	1			8.3E-03		4.6E+00	1.0E+00	1.9E+00	4.8E-02	1		Yes
Prometryn		7287-19-6	2.4E+02	O	1.2E-08	4.9E-07	No	0	2.4E-02	6.2E-06	6.6E+02		1.3E+00	1.3E+00	3.3E+01	3.3E+04			4.7E+01	1.5E+00	0.1	1			1.5E-02		5.7E+00	9.0E-01	2.4E+00	8.9E-02	1		Yes
Propyzamide (Pronamide)		23950-58-5	2.6E+02	O	9.8E-09	4.0E-07	No	0	4.7E-02	5.5E-06	4.0E+02		8.1E-01	8.1E-01	1.5E+01	1.5E+04			1.4E+01	1.0E+00	0.1	1			1.1E-02		6.9E+00	9.0E-01	2.9E+00	6.7E-02	1		Yes
Propachlor		1918-16-7	2.1E+02	O	3.6E-07	1.5E-05	No	0	2.7E-02	7.0E-06	2.0E+02		4.1E-01	4.1E-01	5.8E+02	5.8E+05			3.0E+02	6.1E-01	0.1	1			2.9E-03		3.9E+00	1.0E+00	1.6E+00	1.6E-02	1		Yes
Propanil		709-98-8	2.2E+02	O	1.7E-09	7.0E-08	No	0	2.7E-02	6.9E-06	1.8E+02		3.5E-01	3.5E-01	1.5E+02	1.5E+05			6.9E+01	5.5E-01	0.1	1			1.0E-02		4.2E+00	1.0E+00	1.8E+00	5.9E-02	1		Yes
Propargite		2312-35-8	3.5E+02	O	6.4E-07	2.6E-05	No	0	1.9E-02	4.8E-06	3.7E+04		7.3E+01	7.3E+01	2.2E-01	2.2E+02			1.6E+01	7.4E+01	0.1	1			3.6E-02		2.3E+01	8.0E-01	9.7E+00	2.6E-01	1		Yes
Propargyl alcohol		107-19-7	5.6E+01	O	1.2E-06	4.7E-05	Yes	1	1.2E-01	1.3E-05	1.9E+00		3.8E-03	3.8E-03	1.0E+06	1.0E+09	3.6E-06	6.3E+04	1.0E+05	2.0E-01		1			4.2E-04		5.2E-01	1.0E+00	2.2E-01	1.2E-03	1		Yes
Propazine		139-40-2	2.3E+02	O	4.6E-09	1.9E-07	No	0	2.5E-02	6.4E-06	3.4E+02		6.9E-01	6.9E-01	8.6E+00	8.6E+03			6.8E+00	8.9E-01	0.1	1			7.1E-03		4.9E+00	1.0E+00	2.0E+00	4.2E-02	1		Yes
Propham		122-42-9	1.8E+02	O	1.8E-07	7.5E-06	No	0	3.6E-02	7.1E-06	2.2E+02		4.4E-01	4.4E-01	1.8E+02	1.8E+05			9.6E+01	6.4E-01	0.1	1			8.3E-03		2.5E+00	1.0E+00	1.1E+00	4.3E-02	1		Yes
Propiconazole		60207-90-1	3.4E+02	O	1.7E-09	7.0E-08	No	0	2.1E-02	5.3E-06	1.6E+03		3.1E+00	3.1E+00	1.1E+02	1.1E+05			3.5E+02	3.3E+00	0.1	1			5.6E-03		2.1E+01	9.0E-01	8.7E+00	4.0E-02	1		Yes
n-Propylbenzene		103-65-1	1.2E+02	O	1.1E-02	4.3E-01	Yes	1	6.0E-02	7.8E-06	8.1E+02		1.6E+00	1.6E+00	5.2E+01	5.2E+04	7.6E-04	7.0E+03	9.4E+01	1.9E+00		1			9.4E-02		1.2E+00	1.0E+00	5.0E-01	4.0E-01	1		Yes
Propylene glycol		57-55-6	7.6E+01	O	1.3E-08	5.3E-07	No	0	9.8E-02	1.2E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09			1.0E+05	2.0E-01	0.1	1			1.4E-04		6.7E-01	1.0E+00	2.8E-01	4.8E-04	1		Yes
Propylene glycol, monoethyl ether		52125-53-8	1.0E+02	O	7.4E-08	3.0E-06	Yes	1	8.3E-02	1.0E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09		7.8E+04		2.0E+00		1			3.7E-04		8.1E-01	1.0E+00	3.4E-01	1.4E-03	1		Yes
Propylene glycol, monomethyl ether		107-98-2	9.0E+01	O	9.2E-07	3.8E-05	Yes	1	8.3E-02	1.0E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09	2.3E-06	7.8E+04	1.0E+05	2.0E-01		1			3.7E-04		8.1E-01	1.0E+00	3.4E-01	1.4E-03	1		Yes
Propylene oxide		75-56-9	1.0E+02	O	7.4E-08	3.0E-06	Yes	1	8.3E-02	1.0E-05	1.0E+00		2.0E-03	2.0E-03	1.0E+06	1.0E+09		7.8E+04		2.0E+00		1			3.7E-04		8.1E-01	1.0E+00	3.4E-01	1.4E-03	1		Yes
Pyridine		110-86-1	7.9E+01	O	1.1E-05	4.5E-04	Yes	1	9.3E-02	1.1E-05	7.2E+01		1.4E-01	1.4E-01	1.0E+06	1.0E+09	9.4E-06	5.5E+04	2.4E+05	3.4E-01		1			1.5E-03		7.0E-01	1.0E+00	2.9E-01	5.2E-03	1		Yes
Quinalphos		13593-03-8	3.0E+02	O	4.6E-08	1.9E-06	No	0	4.3E-02	5.0E-06	4.2E+03		8.4E+00	8.4E+00	2.2E+01	2.2E+04			1.9E+02	8.6E+00	0.1	1			3.0E-02		1.2E+01	9.0E-01	4.9E+00	2.0E-01	1		Yes
Quinoline		91-22-5	1.3E+02	O	1.7E-06	6.8E-05	No	0	6.2E-02	8.7E-06	1.5E+03		3.1E+00	3.1E+00	6.1E+03	6.1E+06			1.9E+04	3.3E+00	0.1	1			6.6E-03		1.3E+00	1.0E+00	5.6E-01	2.9E-02	1		Yes
Resmethrin		10453-86-8	3.4E+02	O	1.3E-07	5.4E-06	No	0	3.9E-02	4.6E-06	3.1E+05		6.2E+02	6.2E+02	3.8E-02	3.8E+01			2.4E+01	6.2E+02	0.1	1			2.4E-01		3.3E+01	7.0E-01	8.3E+00	1.7E+00	1		Yes
Ronnel		299-84-3	3.2E+02	O	3.2E-05	1.3E-03	No	1	2.3E-02	5.9E-06	4.5E+03		8.9E+00	8.9E+00	1.0E+00	1.0E+03	1.8E-07	4.6E+05	9.0E+00	9.1E+00		1			4.3E-02		1.6E+01	8.0E-01	6.6E+00	3.0E-01	1		Yes
Rotenone		83-79-4	3.9E+02	O	1.1E-13	4.6E-12	No	0	3.5E-02	4.1E-06	2.6E+05		5.2E+02	5.2E+02	2.0E-01	2.0E+02			1.0E+02	5.2E+02	0.1	1			5.1E-03		4.1E+01	9.0E-01	1.7E+01	3.9E-02	1		Yes
Selenious Acid		7783-00-8	1.3E+02	I			No	0							9.0E+05	9.0E+08						1				1.0E-03	1.3E+00	1.0E+00	5.5E-01	4.4E-03	1		Yes
Selenium		7782-49-2	7.9E+01	I			No	0				5.0E+00	5.0E+00	5.0E+00						5.2E+00		1	50	50		1.0E-03	7.0E-01	1.0E+00	2.9E-01	3.4E-03	1		Yes
Sethoxydim		74051-80-2	3.3E+02	O	2.2E-11	8.8E-10	No	0	2.0E-02	4.8E-06	4.4E+03		8.7E+00	8.7E+00	2.5E+01	2.5E+04			2.2E+02	8.9E+00	0.1	1			1.9E-02		1.7E+01	9.0E-01	7.2E+00	1.3E-01	1		Yes
Silver and compounds		7440-22-4	1.1E+02	I			No	0				8.3E+00	8.3E+00	8.3E+00						8.5E+00		0.04	100			6.0E-04	1.0E+00	1.0E+00	4.2E-01	2.4E-03	1		Yes
Simazine		122-34-9	2.0E+02	O	9.4E-10	3.9E-08	No	0	2.8E-02	7.4E-06	1.5E+02		2.9E-01	2.9E-01	6.2E+00	6.2E+03			2.4E+00	4.9E-01	0.1	1	4	4	3.3E-03		3.4E+00	1.0E+00	1.4E+00	1.8E-02	1		Yes
Sodium azide		26628-22-8	6.5E+01	O			No	0							4.1E+05	4.1E+08						1			1.0E-03		5.8E-01	1.0E+00	2.4E-01	3.1E-03	1		Yes
Sodium diethyldithiocarbamate		148-18-5	1.7E+02	O			No	0	6.1E-02	7.2E-06	2.0E+02		4.1E-01	4.1E-01	3.6E+05	3.6E+08				6.1E-01	0.1	1			1.9E-05		2.3E+00	1.0E+00	9.7E-01	9.7E-05	1		Yes
Sodium fluoroacetate		62-74-8	1.0E+02	O	1.1E-06	4.5E-05	No	0	8.8E-02	1.0E-05	1.4E+00		2.9E-03	2.9E-03	1.1E+06	1.1E+09			1.1E+05	2.0E-01	0.1	1			1.3E-06		9.2E-01	1.0E+00	3.8E-01	5.1E-06	1		No
Sodium metavanadate		13718-26-8	1.2E+02	O			No	0							2.1E+05	2.1E+08						1			1.0E-03		1.2E+00	1.0E+00	5.1E-01	4.2E-03	1		Yes
Strontium, stable		7440-24-6	8.8E+01	I			No	0				3.5E+01	3.5E+01	3.5E+01						3.5E+01		1				1.0E-03	7.8E-01	1.0E+00	3.3E-01	3.6E-03	1		Yes
Strychnine		57-24-9	3.3E+02	O	7.6E-14	3.1E-12	No	0	2.2E-02	5.6E-06	5.4E+03		1.1E+01	1.1E+01	1.6E+02	1.6E+05			1.7E+03	1.1E+01	0.1	1			4.0E-04		1.9E+01	1.0E+00	7.8E+00	2.8E-03	1		Yes
Styrene		100-42-5	1.0E+02	O	2.8E-03	1.1E-01	Yes	1	7.1E-02	8.8E-06	4.5E+02		8.9E-01	8.9E-01	3.1E+02	3.1E+05	4.2E-04	9.3E+03	3.1E+02	1.1E+00		1	100	100	3.7E-02		9.7E-01	1.0E+00	4.0E-01	1.5E-01	1		Yes
1,1'-Sulfonylbis (4-Chlorobenzene)		80-07-9	2.9E+02	O	1.4E-07	5.6E-06	No	0	4.4E-02	5.1E-06	2.9E+03		5.7E+00	5.7E+00	2.4E+00	2.4E+03			1.4E+01	5.9E+00	0.1	1			1.5E-02		1.0E+01	9.0E-01	4.3E+00	9.7E-02	1		Yes
Tebuthiuron		34014-18-1	2.3E+02	O	1.2E-10	4.9E-09	No	0	5.1E-02	5.9E-06	4.2E+01		8.5E-02	8.5E-02	2.5E+03	2.5E+06			4.6E+02	2.8E-01	0.1	1			1.3E-03		4.8E+00	1.0E+00	2.0E+00	7.4E-03	1		Yes
Temephos		3383-96-8	4.7E+02	O	2.0E-09	8.0E-08	No	0	1.8E-02	4.5E-06	9.5E+04		1.9E+02	1.9E+02	2.7E-01	2.7E+02			5.1E+01	1.9E+02	0.1	1			3.5E-02		1.0E+02	7.0E-01	4.3E+01	2.9E-01	1		No
Terbacil		5902-51-2	2.2E+02	O	1.2E-10	4.9E-09	No	0	2.7E-02	7.2E-06	5.0E+01		1.0E-01	1.0E-01	7.1E+02	7.1E+05			1.4E+02	3.0E-01	0.1	1			1.7E-03		4.1E+00	1.0E+00	1.7E+00	9.7E-03	1		Yes
Terbufos		13071-79-9	2.9E+02	O	2.4E-05	9.8E-04	No	1	2.2E-02	5.4E-06	1.0E+03		2.0E+00	2.0E+00	5.1E+00	5.1E+03	5.5E-07	2.6E+05	1.1E+01	2.2E+00		1			3.6E-02		1.0E+01	9.0E-01	4.3E+00	2.3E-01	1		Yes
Terbutryn		886-50-0	2.4E+02	O	2.2E-08	8.8E-07	No	0	2.4E-02	6.0E-06	6.1E+02		1.2E+00	1.2E+00	2.5E+01	2.5E+04			3.3E+01	1.4E+00	0.1	1			2.1E-02		5.7E+00	9.0E-01	2.4E+00	1.3E-01	1		Yes
1,2,4,5-Tetrachlorobenzene		95-94-3	2.2E+02	O	1.0E-03	4.1E-02	No	1	3.2E-02	8.8E-06	2.2E+03		4.4E+00	4.4E+00	6.0E-01	6.0E+02	1.5E-05	5.1E+04	2.7E+00	4.6E+00		1			1.2E-01		6.7E+00	1.0E+00	1.7E+00	6.6E-01	1		Yes
2,3,7,8-Tetrachlorodibenzo-p-dioxin (Dioxin)		1746-01-6	3.2E+02	O	5.0E-05	2.0E-03	No	1	4.7E-02	6.8E-06	2.5E+05		5.0E+02	5.0E+02	2.0E-04	2.0E-01	1.0E-08	2.0E+06	1.0E-01	5.0E+02	0.03	1	0.00003	0.00003	8.1E-01		2.9E+01	5.0E-01	6.7E+00	5.6E+00	1		No
1,1,1,2-Tetrachloroethane		630-20-6	1.7E+02	O	2.5E-03	1.0E-01	Yes	1	4.8E-02	9.1E-06	8.6E+01		1.7E-01	1.7E-01	1.1E+03	1.1E+06	9.0E-04	5.7E+03	3.1E+02	3.8E-01		1			1.6E-02		2.2E+00	1.0E+00	9.2E-01	7.9E-02	1		Yes
1,1,2,2-Tetrachloroethane		79-34-5	1.7E+02	O	3.7E-04	1.5E-02	Yes	1	4.9E-02	9.3E-06	9.5E+01		1.9E-01	1.9E-01	2.8E+03	2.8E+06	1.3E-04	1.5E+04	8.3E+02	3.9E-01		1			6.9E-03		2.2E+00	1.0E+00	9.2E-01	3.5E-02	1		Yes
Tetrachloroethylene (PCE)		127-18-4	1.7E+02	O	1.8E-02	7.2E-01	Yes	1	5.0E-02	9.5E-06	9.5E+01		1.9E-01	1.9E-01	2.1E+02	2.1E+05	4.6E-03	2.3E+03	8.8E+01	4.5E-01		1	5	5	3.3E-02		2.1E+00	1.0E+00	8.9E-01	1.7E-01	1		Yes
2,3,4,6-Tetrachlorophenol		58-90-2	2.3E+02	O	8.8E-06	3.6E-04	No	0	5.0E-02	5.9E-06	2.8E+02		5.6E-01	5.6E-01	2.3E+01	2.3E+04			1.5E+01	7.6E-01	0.1	1			7.1E-02		5.0E+00	9.0E-01	2.1E+00	4.2E-01	1		Yes
p,a,a,a-Tetrachlorotoluene		5216-25-1	2.3E+02	O	1.9E-04	7.9E-03	No	1	2.8E-02	7.3E-06	1.6E+03		3.2E+00	3.2E+00	4.0E+00	4.0E+03	3.5E-06	1.1E+05	1.3E+01	3.4E+00		1			8.4E-02		4.9E+00	9.0E-01	2.0E+00	4.9E-01	1		Yes
Tetrachlorovinphos (Stirofos)		961-11-5	3.7E+02	O	1.8E-09	7.5E-08	No	0	3.7E-02	4.3E-06	1.4E+03		2.8E+00	2.8E+00	1.1E+01	1.1E+04			3.1E+01	3.0E+00	0.1	1			3.1E-03		2.8E+01	9.0E-01	1.2E+01	2.3E-02	1		Yes
Tetraethyldithiopyrophosphate		3689-24-5	3.2E+02	O	4.5E-06	1.8E-04	No	0	2.1E-02	5.3E-06	2.7E+02		5.3E-01	5.3E-01	3.0E+01	3.0E+04			1.9E+01	7.3E-01	0.1	1			1.1E-02		1.6E+01	9.0E-01	6.7E+00	7.5E-02	1		Yes
Thallium and compounds		7440-28-0	2.0E+02	I			No	0				7.1E+01	7.1E+01	7.1E+01						7.1E+01		1	2	2		1.0E-03	3.5E+00	1.0E+00	1.5E+00	5.5E-03	1		Yes
Thiobencarb		28249-77-6	2.6E+02	O	2.7E-07	1.1E-05	No	0	2.3E-02	5.9E-06	1.6E+03		3.3E+00	3.3E+00	2.8E+01	2.8E+04			9.4E+01	3.5E+00	0.1	1			1.0E-02		7.0E+00	9.0E-01	2.9E+00	6.3E-02	1		Yes
Thiofanox		39196-18-4	2.2E+02	O	9.4E-09	3.8E-07	No	0	5.2E-02	6.1E-06	7.2E+01		1.4E-01	1.4E-01	5.2E+03	5.2E+06			1.3E+03	3.4E-01	0.1	1			6.3E-03		4.2E+00	1.0E+00	1.8E+00	3.6E-02	1		Yes
Thiophanate-methyl		23564-05-8	3.4E+02	O	1.2E-09	4.9E-08	No	0	3.9E-02	4.5E-06	3.3E+02		6.5E-01	6.5E-01	2.7E+01	2.7E+04			2.0E+01	8.5E-01	0.1	1			1.6E-04		2.1E+01	1.0E+00	8.7E+00	1.1E-03	1		Yes
Thiram		137-26-8	2.4E+02	O	1.8E-07	7.4E-06	No	0	2.6E-02	6.6E-06	6.1E+02		1.2E+00	1.2E+00	3.0E+01	3.0E+04			4.0E+01	1.4E+00	0.1	1			9.9E-04		5.6E+00	1.0E+00	2.3E+00	5.9E-03	1		Yes
Tin and compounds		7440-31-5	1.2E+02	I			No	0				2.5E+02	2.5E+02	2.5E+02						2.5E+02		1				1.0E-03	1.2E+00	1.0E+00	4.9E-01	4.2E-03	1		Yes
Toluene		108-88-3	9.2E+01	O	6.6E-03	2.7E-01	Yes	1	7.8E-02	9.2E-06	2.3E+02		4.7E-01	4.7E-01	5.3E+02	5.3E+05	1.8E-03	4.3E+03	3.3E+02	6.9E-01		1	1000	1000	3.1E-02		8.3E-01	1.0E+00	3.5E-01	1.1E-01	1		Yes
p-Toluidine		106-49-0	1.1E+02	O	2.0E-06	8.3E-05	No	0	7.1E-02	9.0E-06	1.1E+02		2.3E-01	2.3E-01	6.5E+03	6.5E+06			2.1E+03	4.3E-01	0.1	1			3.3E-03		1.0E+00	1.0E+00	4.2E-01	1.3E-02	1		Yes
Tralomethrin		66841-25-6	6.7E+02	O	3.9E-10	1.6E-08	No	0	2.5E-02	2.9E-06	1.9E+05		3.8E+02	3.8E+02	8.0E-02	8.0E+01			3.1E+01	3.8E+02	0.1	1			3.1E-02		1.3E+03	5.0E-01	5.6E+02	3.0E-01	1		No
Triadimefon (Bayleton)		43121-43-3	2.9E+02	O	8.1E-11	3.3E-09	No	0	2.2E-02	5.7E-06	3.0E+02		6.0E-01	6.0E-01	7.2E+01	7.2E+04			5.0E+01	8.0E-01	0.1	1			2.4E-03		1.1E+01	1.0E+00	4.6E+00	1.6E-02	1		Yes
Triallate		2303-17-5	3.0E+02	O	1.2E-05	4.9E-04	No	1	2.2E-02	5.7E-06	1.0E+03		2.0E+00	2.0E+00	4.0E+00	4.0E+03	2.9E-07	3.6E+05	8.5E+00	2.2E+00		1			3.5E-02		1.3E+01	9.0E-01	5.3E+00	2.3E-01	1		Yes
Triasulfuron		82097-50-5	4.0E+02	O	3.2E-13	1.3E-11	No	0	3.5E-02	4.1E-06	4.3E+02		8.5E-01	8.5E-01	3.2E+01	3.2E+04			3.1E+01	1.1E+00	0.1	1			4.7E-05		4.5E+01	1.0E+00	1.9E+01	3.6E-04	1		Yes
Tribenuron-methyl (Express)		101200-48-0	4.0E+02	O	1.0E-13	4.2E-12	No	0	3.5E-02	4.1E-06	9.5E+01		1.9E-01	1.9E-01	5.0E+01	5.0E+04			1.4E+01	3.9E-01	0.1	1			4.7E-04		4.1E+01	1.0E+00	1.7E+01	3.6E-03	1		Yes
1,2,4-Tribromobenzene		615-54-3	3.1E+02	O	3.4E-04	1.4E-02	No	1	2.9E-02	7.9E-06	6.1E+02		1.2E+00	1.2E+00	4.9E+00	4.9E+03	1.6E-05	4.8E+04	6.5E+00	1.4E+00		1			3.4E-02		1.5E+01	9.0E-01	6.1E+00	2.3E-01	1		Yes
Tributyltin oxide (TBTO)		56-35-9	6.0E+02	O	3.0E-07	1.2E-05	No	0	1.5E-02	3.6E-06	2.6E+07		5.2E+04	5.2E+04	2.0E+01	2.0E+04			1.0E+06	5.2E+04	0.1	1			2.5E-04		5.5E+02	1.0E+00	2.3E+02	2.4E-03	1		Yes
2,4,6-Trichloroaniline		634-93-5	2.0E+02	O	1.3E-06	5.5E-05	No	0	5.6E-02	6.6E-06	4.4E+03		8.9E+00	8.9E+00	4.0E+01	4.0E+04			3.6E+02	9.1E+00	0.1	1			2.7E-02		3.2E+00	1.0E+00	1.3E+00	1.5E-01	1		Yes
2,4,6-Trichloroaniline hydrochloride		33663-50-2	2.3E+02	O	7.2E-14	2.9E-12	No	0	5.0E-02	5.9E-06	1.3E+03		2.5E+00	2.5E+00	2.1E+01	2.1E+04			5.5E+01	2.7E+00	0.1	1			2.8E-05		5.1E+00	1.0E+00	2.1E+00	1.6E-04	1		Yes
1,2,4-Trichlorobenzene		120-82-1	1.8E+02	O	1.4E-03	5.8E-02	No	1	4.0E-02	8.4E-06	1.4E+03		2.7E+00	2.7E+00	4.9E+01	4.9E+04	4.3E-05	3.0E+04	1.4E+02	2.9E+00		1	70	70	7.1E-02		2.6E+00	1.0E+00	1.1E+00	3.7E-01	1		Yes
1,1,1-Trichloroethane		71-55-6	1.3E+02	O	1.7E-02	7.0E-01	Yes	1	6.5E-02	9.6E-06	4.4E+01		8.8E-02	8.8E-02	1.3E+03	1.3E+06	7.6E-03	1.6E+03	4.1E+02	3.5E-01		1	200	200	1.3E-02		1.4E+00	1.0E+00	5.9E-01	5.6E-02	1		Yes
1,1,2-Trichloroethane		79-00-5	1.3E+02	O	8.2E-04	3.4E-02	Yes	1	6.7E-02	1.0E-05	6.1E+01		1.2E-01	1.2E-01	4.6E+03	4.6E+06	5.3E-04	7.2E+03	1.0E+03	3.2E-01		1	5	5	5.0E-03		1.4E+00	1.0E+00	5.9E-01	2.2E-02	1		Yes

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-2: CHEMICAL-SPECIFIC PARAMETERS

Contaminant	CAS	MW (g/mol)	Organic/ Inorganic	Henry's Law Constant H_units (atm-m³/mol)	H' (H_unitless) (unitless)	VP>1?	VOL	D_i (cm^2/s)	D_w (cm^2/s)	K_{oc} (organics) (cm^3/g)	K_d (inorganics) (cm^3/g)	K_{d_VF} (cm^3/g)	$K_{d\_S\_to\_gw}$ (cm^3/g)	S (mg/L-water)	S (µg/L-water)	D_A (cm^2/s)	VF (m^3/kg)	SAT (mg/kg)	soil-to-gw factor (kg/L)	ABS_d	ABS_{GI}	Title 18 MCL (µg/L)	EPA Fed MCL MCL (µg/L)	Kp.org (cm/hr)	Kp.inorg (cm/hr)	t_star (hr)	FA (unitless)	tau_event (hr)	B (unitless)	RBA (unitless)	Mutagen	In EPD?
Trichloroethylene (TCE) Long-term +++	79-01-6	1.3E+02	O	9.9E-03	4.0E-01	Yes	1	6.9E-02	1.0E-05	6.1E+01		1.2E-01	1.2E-01	1.3E+03	1.3E+06	4.9E-03	2.2E+03	3.8E+02	3.6E-01		1	5	5	1.2E-02		1.4E+00	1.0E+00	5.7E-01	5.1E-02	1	M	Yes
Trichlorofluoromethane	75-69-4	1.4E+02	O	9.7E-02	4.0E+00	Yes	1	6.5E-02	1.0E-05	4.4E+01		8.8E-02	8.8E-02	1.1E+03	1.1E+06	1.5E-02	1.0E+03	1.0E+03	6.4E-01		1			1.3E-02		1.5E+00	1.0E+00	6.2E-01	5.7E-02	1		Yes
2,4,5-Trichlorophenol	95-95-4	2.0E+02	O	1.6E-06	6.6E-05	No	0	3.1E-02	8.1E-06	1.6E+03		3.2E+00	3.2E+00	1.2E+03	1.2E+06			4.0E+03	3.4E+00	0.1	1			3.6E-02		3.2E+00	1.0E+00	1.3E+00	2.0E-01	1		Yes
2,4,6-Trichlorophenol	88-06-2	2.0E+02	O	2.6E-06	1.1E-04	No	0	3.1E-02	8.1E-06	3.8E+02		7.6E-01	7.6E-01	8.0E+02	8.0E+05			6.9E+02	9.6E-01	0.1	1			3.5E-02		3.2E+00	1.0E+00	1.3E+00	1.9E-01	1		Yes
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	2.6E+02	O	8.7E-09	3.5E-07	No	0	2.9E-02	7.8E-06	1.1E+02		2.1E-01	2.1E-01	2.8E+02	2.8E+05			8.7E+01	4.1E-01	0.1	1			9.1E-03		6.8E+00	9.0E-01	2.8E+00	5.6E-02	1		Yes
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	93-72-1	2.7E+02	O	9.1E-09	3.7E-07	No	0	2.3E-02	5.9E-06	1.8E+02		3.5E-01	3.5E-01	7.1E+01	7.1E+04			3.2E+01	5.5E-01	0.1	1	50	50	1.6E-02		8.2E+00	9.0E-01	3.4E+00	1.0E-01	1	TCE	Yes
1,1,2-Trichloropropane	598-77-6	1.5E+02	O	3.2E-04	1.3E-02	Yes	1	5.7E-02	9.2E-06	9.5E+01		1.9E-01	1.9E-01	1.9E+03	1.9E+06	1.4E-04	1.5E+04	5.6E+02	3.9E-01		1			9.6E-03		1.7E+00	1.0E+00	7.0E-01	4.5E-02	1		Yes
1,2,3-Trichloropropane	96-18-4	1.5E+02	O	3.4E-04	1.4E-02	Yes	1	5.7E-02	9.2E-06	1.2E+02		2.3E-01	2.3E-01	1.8E+03	1.8E+06	1.3E-04	1.6E+04	5.8E+02	4.3E-01		1			7.5E-03		1.7E+00	1.0E+00	7.0E-01	3.5E-02	1	M	Yes
1,2,3-Trichloropropene	96-19-5	1.5E+02	O	1.8E-02	7.2E-01	Yes	1	5.9E-02	9.4E-06	1.2E+02		2.3E-01	2.3E-01	3.3E+02	3.3E+05	4.8E-03	2.3E+03	1.6E+02	5.0E-01		1			1.7E-02		1.6E+00	1.0E+00	6.9E-01	7.8E-02	1		Yes
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	1.9E+02	O	5.3E-01	2.2E+01	Yes	1	3.8E-02	8.6E-06	2.0E+02		3.9E-01	3.9E-01	1.7E+02	1.7E+05	9.4E-03	1.3E+03	7.8E+02	2.5E+00		1			1.8E-02		2.8E+00	1.0E+00	1.2E+00	9.2E-02	1		Yes
Tridiphane	58138-08-2	3.2E+02	O	4.1E-07	1.7E-05	No	0	4.1E-02	4.7E-06	3.4E+03		6.9E+00	6.9E+00	1.1E+00	1.1E+03			8.0E+00	7.1E+00	0.1	1			6.9E-02		1.6E+01	8.0E-01	6.6E+00	4.7E-01	1		Yes
Triethylamine	121-44-8	1.0E+02	O	1.5E-04	6.1E-03	Yes	1	6.6E-02	7.9E-06	5.1E+01		1.0E-01	1.0E-01	6.9E+04	6.9E+07	1.1E-04	1.6E+04	1.4E+04	3.0E-01		1			3.9E-03		9.3E-01	1.0E+00	3.9E-01	1.5E-02	1		Yes
Trifluralin	1582-09-8	3.4E+02	O	1.0E-04	4.2E-03	No	1	2.2E-02	5.6E-06	1.6E+04		3.3E+01	3.3E+01	1.8E-01	1.8E+02	1.5E-07	5.1E+05	6.1E+00	3.3E+01		1			7.3E-02		1.9E+01	8.0E-01	7.9E+00	5.1E-01	1		Yes
1,2,4-Trimethylbenzene	95-63-6	1.2E+02	O	6.2E-03	2.5E-01	Yes	1	6.1E-02	7.9E-06	6.1E+02		1.2E+00	1.2E+00	5.7E+01	5.7E+04	5.9E-04	7.9E+03	7.8E+01	1.5E+00		1			8.6E-02		1.2E+00	1.0E+00	5.0E-01	3.6E-01	1		Yes
1,3,5-Trimethylbenzene	108-67-8	1.2E+02	O	8.8E-03	3.6E-01	Yes	1	6.0E-02	7.8E-06	6.0E+02		1.2E+00	1.2E+00	4.8E+01	4.8E+04	8.4E-04	6.6E+03	6.6E+01	1.4E+00		1			6.2E-02		1.2E+00	1.0E+00	5.0E-01	2.6E-01	1		Yes
Trimethyl phosphate	512-56-1	1.4E+02	O	7.2E-09	2.9E-07	No	0	5.8E-02	8.8E-06	1.1E+01		2.1E-02	2.1E-02	5.0E+05	5.0E+08			6.1E+04	2.2E-01	0.1	1			9.5E-05		1.5E+00	1.0E+00	6.4E-01	4.3E-04	1		Yes
1,3,5-Trinitrobenzene	99-35-4	2.1E+02	O	6.5E-09	2.7E-07	No	0	2.9E-02	7.7E-06	1.7E+03		3.4E+00	3.4E+00	2.8E+02	2.8E+05			9.6E+02	3.6E+00	0.019	1			6.1E-04		3.9E+00	1.0E+00	1.6E+00	3.4E-03	1		Yes
Trinitrophenylmethylnitramine (Tetryl)	479-45-8	2.9E+02	O	2.7E-09	1.1E-07	No	0	2.6E-02	6.7E-06	4.6E+03		9.2E+00	9.2E+00	7.4E+01	7.4E+04			6.9E+02	9.4E+00	0.00065	1			4.7E-04		1.0E+01	1.0E+00	4.3E+00	3.1E-03	1		Yes
2,4,6-Trinitrotoluene (TNT)	118-96-7	2.3E+02	O	2.1E-08	8.5E-07	No	0	3.0E-02	7.9E-06	2.8E+03		5.6E+00	5.6E+00	1.2E+02	1.2E+05			6.6E+02	5.8E+00	0.032	1			9.6E-04		4.7E+00	1.0E+00	2.0E+00	5.6E-03	1		Yes
Triphenylphosphine oxide	791-28-6	2.8E+02	O	5.3E-10	2.2E-08	No	0	2.3E-02	5.8E-06	2.0E+03		3.9E+00	3.9E+00	6.3E+01	6.3E+04			2.5E+02	4.1E+00	0.1	1			3.3E-03		9.1E+00	1.0E+00	3.8E+00	2.1E-02	1		Yes
Tris(2-chloroethyl) phosphate	115-96-8	2.9E+02	O	3.3E-06	1.3E-04	No	0	2.4E-02	6.2E-06	3.9E+02		7.8E-01	7.8E-01	7.0E+03	7.0E+06			6.1E+03	9.8E-01	0.1	1			3.6E-04		1.0E+01	1.0E+00	4.2E+00	2.3E-03	1		Yes
Uranium (chemical toxicity only)	7440-61-0	2.4E+02	O			No	0				4.5E+02	4.5E+02	4.5E+02						4.5E+02		1	30	30	1.0E-03		5.4E+00	1.0E+00	2.3E+00	5.9E-03	1		Yes
Vanadium and compounds +++	7440-62-2	5.1E+01	I			No	0				1.0E+03	1.0E+03	1.0E+03						1.0E+03		0.026				1.0E-03	4.9E-01	1.0E+00	2.0E-01	2.7E-03	1		Yes
Vernolate (Vernam)	1929-77-7	2.0E+02	O	3.1E-05	1.3E-03	No	1	2.4E-02	6.1E-06	3.0E+02		6.0E-01	6.0E-01	9.0E+01	9.0E+04	2.4E-06	1.2E+05	6.3E+01	8.0E-01		1			4.0E-02		3.5E+00	1.0E+00	1.4E+00	2.2E-01	1		Yes
Vinclozolin	50471-44-8	2.9E+02	O	1.7E-08	7.1E-07	No	0	2.5E-02	6.5E-06	2.8E+02		5.7E-01	5.7E-01	2.6E+00	2.6E+03			1.7E+00	7.7E-01	0.1	1			4.5E-03		1.0E+01	9.0E-01	4.2E+00	2.9E-02	1		Yes
Vinyl acetate	108-05-4	8.6E+01	O	5.1E-04	2.1E-02	Yes	1	8.5E-02	1.0E-05	5.6E+00		1.1E-02	1.1E-02	2.0E+04	2.0E+07	8.2E-04	4.4E+03	2.3E+03	2.1E-01		1			1.6E-03		7.7E-01	1.0E+00	3.2E-01	5.6E-03	1		Yes
Vinyl bromide	593-60-2	1.1E+02	O	1.2E-02	5.0E-01	Yes	1	8.6E-02	1.2E-05	2.2E+01		4.3E-02	4.3E-02	7.6E+03	7.6E+06	9.7E-03	1.4E+03	1.8E+03	2.9E-01		1			4.4E-03		1.0E+00	1.0E+00	4.2E-01	1.7E-02	1		Yes
Vinyl chloride +++	75-01-4	6.2E+01	O	2.8E-02	1.1E+00	Yes	1	1.1E-01	1.2E-05	2.2E+01		4.3E-02	4.3E-02	8.8E+03	8.8E+06	1.8E-02	9.6E+02	3.2E+03	3.4E-01		1	2	2	8.4E-03		5.7E-01	1.0E+00	2.4E-01	2.5E-02	1	M	Yes
Warfarin	81-81-2	3.1E+02	O	2.8E-09	1.1E-07	No	0	4.2E-02	4.9E-06	4.3E+02		8.5E-01	8.5E-01	1.7E-01	1.7E+04			1.6E+01	1.1E+00	0.1	1			1.8E-03		1.3E+01	1.0E+00	5.6E+00	1.2E-02	1		Yes
Xylenes	1330-20-7	1.1E+02	O	6.6E-03	2.7E-01	Yes	1	6.9E-02	8.5E-06	3.8E+02		7.7E-01	7.7E-01	1.1E+02	1.1E+05	1.1E-03	5.7E+03	9.7E+01	9.9E-01		1	10000	10000	5.0E-02		9.9E-01	1.0E+00	4.1E-01	2.0E-01	1		Yes
Zinc	7440-66-6	6.5E+01	I			No	0				6.2E+01	6.2E+01							6.2E+01		1	5000			6.0E-04	5.9E-01	1.0E+00	2.4E-01	1.9E-03	1		Yes
Zinc phosphide	1314-84-7	2.6E+02	I			No	0														1				6.0E-04	7.0E+00	1.0E+00	2.9E+00	3.7E-03	1	VC	Yes
Zineb	12122-67-7	2.8E+02	O	2.7E-09	1.1E-07	No	0	4.5E-02	5.2E-06	1.3E+03		2.7E+00	2.7E+00	1.0E+01	1.0E+04			2.8E+01	2.9E+00	0.1	1			3.3E-04		8.8E+00	1.0E+00	3.7E+00	2.1E-03	1		Yes

Notes:

[1] Henry's Law constant value for Perfluorooctanoic acid (PFOA) was obtained from Sander (2015) and the Koc value was obtained from Larsen and Giovalle (2015).
* At VCP sites where chromium is a potential contaminant of concern, such as a former metal plating facility, the VCP applicant should collect media samples for both chromium III and chromium VI analyses.

+++ See Section 6.4 of Appendix A, Protocol for VCP Remediation Goal Lookup Tables, Nebraska Voluntary Cleanup Program for more information.

ABS_d = absorbtion dermal pathway
ABS_{GI} = absorption gastro-intestinal
B = Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis
CAS = Chemical Abstract Service number
D_A = Apparent diffusivity
D_i = Diffusivity in air
D_w = Diffusivity in water
H = Henry's Law Constant
K_d = Soil-water partition coefficient
K_{d_VF} = Soil-water partition coefficient
K_{oc} = Soil-organic carbon-water partition coefficient
Kp.org = Dermal pereability coefficent - organic chemcial
Kp.inorg = Dermal pereability coefficent - inorganic chemcial
MCL = Maximum contaminant level
MW = Molecular weight
RBA = Relative bioavailability
S = Solubility
SAT = Saturation in soils
soil-to-gw = soil to groundwater
t_star = time to reach steady state
tau_event = lag time per event
VF = Volatilization factor
VOL = Volatile compound
VP = Vapor pressure

Sander, R. 2005. Compilation fo Henry's Law Constants (version 4.0) for water as a solvent. Atmos. Chem. Phys. 15, 4399-4981.
Larsen, P.B., and E. Giovalle. 2015. Perfluoralklated substances: PFOA, PFOS, and PFSOA. Environmental Project No. 1665, The Danish Environmental Protection Agency. Copenhagen.

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Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-3: GROUNDWATER REMEDIAL GOALS

CONTAMINANT	RESIDENTIAL GROUNDWATER							
	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Acephate	--	--	--	--	6.0E+00	8.6E+03	--	6.0E+00
Acetaldehyde	--	--	2.6E+00	2.6E+00	--	--	4.7E+00	4.7E+00
Acetochlor	--	--	--	--	1.0E+02	7.4E+02	--	8.8E+01
Acetone	--	--	--	--	4.5E+03	1.1E+06	1.6E+04	3.5E+03
Acetone cyanohydrin	--	--	--	--	--	--	--	--
Acetonitrile	--	--	--	--	--	--	3.1E+01	3.1E+01
Acrolein	--	--	--	--	2.5E+00	4.2E+02	1.0E-02	1.0E-02
Acrylamide	5.0E-02	2.3E+01	--	5.0E-02	1.0E+01	5.3E+03	--	1.0E+01
Acrylic acid	--	--	--	--	2.5E+03	2.8E+05	5.2E-01	5.2E-01
Acrylonitrile	1.4E-01	1.4E+01	8.3E-02	5.2E-02	2.0E+02	2.2E+04	1.0E+00	1.0E+00
Alachlor	1.4E+00	4.4E+00	--	1.1E+00	5.0E+01	1.7E+02	--	3.9E+01
Aldicarb	--	--	--	--	5.0E+00	3.6E+02	--	4.9E+00
Aldicarb sulfone	--	--	--	--	5.0E+00	6.0E+03	--	5.0E+00
Aldrin	4.6E-03	--	1.1E-03	9.2E-04	1.5E-01	--	--	1.5E-01
Allyl alcohol	--	--	--	--	2.5E+01	3.3E+03	5.2E-02	5.2E-02
Allyl chloride	3.7E+00	3.5E+01	9.4E-01	7.3E-01	--	--	5.2E-01	5.2E-01
Aluminum	--	--	--	--	5.0E+03	1.1E+06	--	5.0E+03
Aluminum phosphide	--	--	--	--	2.0E+00	4.6E+02	--	2.0E+00
Ametryn	--	--	--	--	4.5E+01	2.4E+02	--	3.8E+01
m-Aminophenol	--	--	--	--	4.0E+02	7.0E+04	--	4.0E+02
Amitraz	--	--	--	--	1.3E+01	2.4E+00	--	2.0E+00
Ammonia +++	--	--	--	--	--	--	2.6E+02	2.6E+02
Ammonium sulfamate	--	--	--	--	1.0E+03	2.3E+05	--	1.0E+03
Aniline	1.4E+01	6.9E+02	--	1.3E+01	3.5E+01	1.9E+03	--	3.4E+01
Antimony and compounds	--	--	--	--	2.0E+00	6.8E+01	--	1.9E+00
Antimony pentoxide	--	--	--	--	2.5E+00	8.5E+01	--	2.4E+00
Antimony potassium tartrate	--	--	--	--	4.5E+00	1.5E+02	--	4.4E+00
Antimony tetroxide	--	--	--	--	2.0E+00	6.8E+01	--	1.9E+00
Antimony trioxide	--	--	--	--	--	--	--	--
Arsenic (inorganic) +++	5.2E-02	1.5E+00	--	5.0E-02	1.5E+00	5.1E+01	--	1.5E+00
Arsine	--	--	--	--	1.8E-02	2.0E+00	--	1.7E-02
Assure	--	--	--	--	4.5E+01	9.5E+01	--	3.1E+01
Asulam	--	--	--	--	1.8E+02	1.4E+05	--	1.8E+02
Atrazine	3.4E-01	2.8E+00	--	3.0E-01	1.8E+02	1.6E+03	--	1.6E+02

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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CONTAMINANT	RESIDENTIAL GROUNDWATER							
	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Avermectin B1	--	--	--	--	2.0E+00	--	--	2.0E+00
Azobenzene	7.1E-01	7.3E-01	1.8E-01	1.2E-01	--	--	--	--
Barium and compounds	--	--	--	--	1.0E+03	1.6E+04	--	9.4E+02
Benfluralin (Benefin)	--	--	--	--	2.5E+01	9.9E+00	--	7.1E+00
Bensulfuron-methyl (Londax)	--	--	--	--	1.0E+03	6.0E+04	--	9.9E+02
Bentazone (Bentazon)	--	--	--	--	1.5E+02	2.4E+03	--	1.4E+02
Benzaldehyde	1.9E+01	4.4E+02	--	1.9E+01	5.0E+02	1.2E+04	--	4.8E+02
Benzene	1.4E+00	9.8E+00	7.2E-01	4.6E-01	2.0E+01	1.5E+02	1.6E+01	8.3E+00
Benzidine	1.1E-04	5.0E-03	--	1.1E-04	1.5E+01	7.6E+02	--	1.5E+01
Benzoic acid	--	--	--	--	2.0E+04	3.0E+05	--	1.9E+04
Benzotrichloride	6.0E-03	6.0E-03	--	3.0E-03	--	--	--	--
Benzyl alcohol	--	--	--	--	5.0E+02	2.2E+04	--	4.9E+02
Benzyl chloride	4.6E-01	3.4E+00	1.1E-01	8.9E-02	1.0E+01	8.0E+01	5.2E-01	4.9E-01
Beryllium and compounds	--	--	--	--	1.0E+01	1.6E+01	--	6.2E+00
Biphenthrin (Talstar)	--	--	--	--	7.5E+01	--	--	7.5E+01
1,1-Biphenyl	9.7E+00	6.5E+00	--	3.9E+00	2.5E+03	1.8E+03	2.1E-01	2.1E-01
Bis(2-chloroethyl)ether	7.1E-02	2.7E+00	1.7E-02	1.4E-02	--	--	--	--
Bis(chloromethyl)ether	3.5E-04	3.4E-02	9.1E-05	7.2E-05	--	--	--	--
Bis(2-chloro-1-methylethyl)ether	--	--	--	--	2.0E+02	1.6E+03	--	1.8E+02
Bis(2-ethylhexyl)phthalate (DEHP)	5.6E+00	--	--	5.6E+00	1.0E+02	--	--	1.0E+02
Bisphenol A	--	--	--	--	2.5E+02	8.1E+02	--	1.9E+02
Boron	--	--	--	--	1.0E+03	2.3E+05	--	1.0E+03
Boron trifluoride	--	--	--	--	2.0E+02	4.6E+04	6.8E+00	6.6E+00
Bromate	1.1E-01	2.1E+01	--	1.1E-01	2.0E+01	4.6E+03	--	2.0E+01
Bromobenzene	--	--	--	--	4.0E+01	1.4E+02	3.1E+01	1.6E+01
Bromodichloromethane	1.3E+00	1.9E+01	1.5E-01	1.3E-01	1.0E+02	1.6E+03	--	9.4E+01
Bromoform (Tribromomethane)	9.9E+00	1.4E+02	5.1E+00	3.3E+00	1.0E+02	1.6E+03	--	9.4E+01
Bromomethane	--	--	--	--	7.0E+00	2.5E+02	2.6E+00	1.9E+00
Bromophos	--	--	--	--	2.5E+01	1.4E+01	--	8.9E+00
Bromoxynil	7.8E-01	3.2E+00	--	6.3E-01	7.5E+01	3.3E+02	--	6.1E+01
Bromoxynil octanoate	7.8E-01	3.7E-01	--	2.5E-01	7.5E+01	3.9E+01	--	2.6E+01
1,3-Butadiene	2.3E-02	1.6E-01	1.9E-01	1.8E-02	--	--	1.0E+00	1.0E+00
1-Butanol	--	--	--	--	5.0E+02	2.5E+04	--	4.9E+02
Butylate	--	--	--	--	2.5E+02	2.1E+02	--	1.1E+02
Butyl benzyl phthalate	4.1E+01	2.7E+01	--	1.6E+01	1.0E+03	7.2E+02	--	4.2E+02

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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CONTAMINANT	RESIDENTIAL GROUNDWATER							
	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Butylphthalyl butylglycolate	--	--	--	--	5.0E+03	1.0E+04	--	3.4E+03
Cacodylic acid	--	--	--	--	1.0E+02	1.7E+04	--	1.0E+02
Cadmium and compounds +++	--	--	--	--	5.0E+00	--	--	5.0E+00
Camphechlor (Toxaphene)	7.1E-02	--	--	7.1E-02	--	--	--	--
Caprolactam	--	--	--	--	2.5E+03	2.2E+05	--	2.5E+03
Captafol	5.2E-01	1.8E+00	--	4.0E-01	1.0E+01	3.8E+01	--	7.9E+00
Captan	3.4E+01	3.6E+02	--	3.1E+01	6.5E+02	7.5E+03	--	6.0E+02
Carbaryl	--	--	--	--	5.0E+02	5.9E+03	--	4.6E+02
Carbofuran	--	--	--	--	2.5E+01	3.6E+02	--	2.3E+01
Carbon disulfide	--	--	--	--	5.0E+02	5.0E+03	3.7E+02	2.0E+02
Carbon tetrachloride	1.1E+00	4.3E+00	9.4E-01	4.6E-01	2.0E+01	8.5E+01	5.2E+01	1.2E+01
Carbosulfan	--	--	--	--	2.5E+00	1.7E+01	--	2.2E+00
Carboxin	--	--	--	--	5.0E+02	1.0E+04	--	4.8E+02
Chloramben	--	--	--	--	7.5E+01	1.8E+03	--	7.2E+01
Chloranil	1.9E-01	3.5E+00	--	1.8E-01	--	--	--	--
Chlordane	2.2E-01	3.6E-02	5.6E-02	2.0E-02	2.5E+00	4.4E-01	3.7E-01	1.9E-01
Chlordecone (Kepone)	7.8E-03	6.5E-03	--	3.5E-03	1.5E+00	1.4E+00	--	7.1E-01
Chlorimuron-ethyl	--	--	--	--	4.5E+02	1.7E+04	--	4.4E+02
Chlorine	--	--	--	--	5.0E+02	1.1E+05	7.8E-02	7.8E-02
Chlorine dioxide	--	--	--	--	1.5E+02	3.4E+04	1.0E-01	1.0E-01
Chloroacetic acid	--	--	--	--	--	--	--	--
2-Chloroacetophenone	--	--	--	--	--	--	--	--
4-Chloroaniline	3.9E-01	5.9E+00	--	3.7E-01	2.0E+01	3.3E+02	--	1.9E+01
Chlorobenzene	--	--	--	--	1.0E+02	3.2E+02	2.6E+01	1.9E+01
Chlorobenzilate	7.1E-01	5.6E-01	--	3.1E-01	1.0E+02	8.7E+01	--	4.6E+01
p-Chlorobenzoic acid	--	--	--	--	1.5E+02	8.5E+02	--	1.3E+02
4-Chlorobenzotrifluoride	--	--	--	--	1.5E+01	2.3E+01	1.6E+02	8.6E+00
2-Chloro-1,3-butadiene	--	--	1.9E-02	1.9E-02	1.0E+02	4.4E+02	1.0E+01	9.2E+00
1-Chlorobutane	--	--	--	--	2.0E+02	7.6E+02	--	1.6E+02
1-Chloro-1,1-difluoroethane	--	--	--	--	--	--	2.6E+04	2.6E+04
Chlorodifluoromethane	--	--	--	--	--	--	2.6E+04	2.6E+04
2-Chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester s	3.1E+00	2.3E+00	--	1.3E+00	2.5E+02	2.1E+02	--	1.1E+02
Chloroform	2.5E+00	2.9E+01	2.4E-01	2.2E-01	5.0E+01	6.3E+02	5.1E+01	2.4E+01
Chloromethane	--	--	--	--	--	--	4.7E+01	4.7E+01
4-Chloro-2-methylaniline hydrochloride	1.7E-01	5.1E+02	--	1.7E-01	--	--	--	--

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	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
beta-Chloronaphthalene	--	--	--	--	4.0E+02	3.5E+02	--	1.9E+02
o-Chloronitrobenzene	2.6E-01	2.6E+00	--	2.4E-01	1.5E+01	1.6E+02	--	1.4E+01
p-Chloronitrobenzene	1.3E+00	1.0E+01	--	1.2E+00	3.5E+00	3.0E+01	--	3.1E+00
2-Chlorophenol	--	--	--	--	2.5E+01	2.5E+02	--	2.3E+01
Chlorothalonil	2.5E+01	1.6E+02	--	2.2E+01	7.5E+01	5.2E+02	--	6.6E+01
o-Chlorotoluene	--	--	--	--	1.0E+02	1.4E+02	--	5.9E+01
Chlorpropham	--	--	--	--	2.5E+02	6.1E+02	--	1.8E+02
Chlorpyrifos	--	--	--	--	5.0E+00	3.6E+00	--	2.1E+00
Chlorpyrifos-methyl	--	--	--	--	5.0E+01	7.3E+01	--	3.0E+01
Chlorsulfuron	--	--	--	--	2.5E+02	1.4E+04	--	2.5E+02
Chlorthiophos	--	--	--	--	4.0E+00	8.6E-01	--	7.1E-01
Chromium, Total	--	--	--	--	--	--	--	--
Chromium III *	--	--	--	--	7.5E+03	2.2E+04	--	5.6E+03
Chromium VI +++	5.0E-02	1.2E-01	--	3.5E-02	1.5E+01	4.3E+01	--	1.1E+01
Clofentezine (Apollo)	--	--	--	--	6.5E+01	5.3E+02	--	5.8E+01
Cobalt	--	--	--	--	1.5E+00	8.5E+02	--	1.5E+00
Coke Oven Emissions	--	--	3.3E-03	3.3E-03	--	--	--	--
Copper and compounds	--	--	--	--	2.0E+02	4.6E+04	--	2.0E+02
Crotonaldehyde	--	--	--	--	--	3.7E+02	--	--
Cumene (Isopropylbenzene)	--	--	--	--	5.0E+02	4.8E+02	2.1E+02	1.1E+02
Cyanazine	9.3E-02	1.6E+00	--	8.8E-02	1.0E+01	1.9E+02	--	9.5E+00
Cyanide (free)	--	--	--	--	3.0E+00	6.8E+02	4.2E-01	3.7E-01
Cyanide (hydrogen)	--	--	--	--	3.0E+00	6.8E+02	4.2E-01	3.7E-01
Cyanogen	--	--	--	--	5.0E+00	1.3E+03	--	5.0E+00
Cyanogen bromide	--	--	--	--	4.5E+02	4.0E+05	--	4.5E+02
Cyanogen chloride	--	--	--	--	2.5E+02	1.4E+05	--	2.5E+02
Cyclohexane	--	--	--	--	--	--	3.1E+03	3.1E+03
Cyclohexanone	--	--	--	--	2.5E+04	1.6E+06	3.7E+02	3.6E+02
Cyclohexylamine	--	--	--	--	1.0E+03	2.3E+04	--	9.6E+02
Cyfluthrin (Baythroid)	--	--	--	--	1.3E+02	3.9E+01	--	3.0E+01
Cyhalothrin (Karate)	--	--	--	--	5.0E+00	--	--	5.0E+00
Cyromazine	--	--	--	--	2.5E+03	2.0E+05	--	2.5E+03
Dacthal	--	--	--	--	5.0E+01	8.1E+01	--	3.1E+01
Dalapon	--	--	--	--	1.5E+02	1.4E+04	--	1.5E+02
Daminozide (Alar)	4.3E+00	1.3E+04	--	4.3E+00	7.5E+02	2.5E+06	--	7.5E+02

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	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Demeton	--	--	--	--	2.0E-01	2.2E-01	--	1.1E-01
Diallate	1.3E+00	9.2E-01	--	5.4E-01	--	--	--	--
Diazinon	--	--	--	--	3.5E+00	9.8E+00	--	2.6E+00
Dibenzofuran	--	--	--	--	5.0E+00	3.2E+00	--	2.0E+00
1,4-Dibromobenzene	--	--	--	--	5.0E+01	9.2E+01	--	3.3E+01
Dibromochloromethane	9.3E-01	1.4E+01	--	8.7E-01	1.0E+02	1.7E+03	--	9.5E+01
1,2-Dibromo-3-chloropropane	3.1E-02	1.7E-01	3.4E-04	3.3E-04	1.0E+00	5.9E+00	1.0E-01	9.3E-02
1,2-Dibromoethane	3.9E-02	7.1E-01	9.4E-03	7.5E-03	4.5E+01	9.0E+02	4.7E+00	4.2E+00
Dibutyl phthalate	--	--	--	--	5.0E+02	4.1E+02	--	2.3E+02
Dicamba	--	--	--	--	1.5E+02	2.5E+03	--	1.4E+02
1,2-Dichlorobenzene	--	--	--	--	4.5E+02	7.3E+02	1.0E+02	7.6E+01
1,4-Dichlorobenzene	1.4E+01	2.1E+01	5.1E-01	4.8E-01	3.5E+02	5.6E+02	4.2E+02	1.4E+02
3,3-Dichlorobenzidine	1.7E-01	4.5E-01	--	1.3E-01	--	--	--	--
4,4'-Dichlorobenzophenone	--	--	--	--	4.5E+01	3.4E+01	--	1.9E+01
1,4-Dichloro-2-butene	--	--	1.3E-03	1.3E-03	--	--	--	--
Dichlorodifluoromethane	--	--	--	--	1.0E+03	9.6E+03	5.2E+01	4.9E+01
p,p'-Dichlorodiphenyldichloroethane (DDD)	3.2E-01	3.5E-02	--	3.2E-02	1.5E-01	1.8E-02	--	1.6E-02
p,p'-Dichlorodiphenyldichloroethylene (DDE)	2.3E-01	--	5.8E-02	4.6E-02	1.5E+00	--	--	1.5E+00
p,p'-Dichlorodiphenyltrichloroethane (DDT)	2.3E-01	--	--	2.3E-01	2.5E+00	--	--	2.5E+00
1,1-Dichloroethane	1.4E+01	1.8E+02	3.5E+00	2.8E+00	1.0E+03	1.5E+04	--	9.4E+02
1,2-Dichloroethane	8.6E-01	1.8E+01	2.2E-01	1.7E-01	3.0E+01	7.0E+02	3.7E+00	3.2E+00
1,1-Dichloroethylene	--	--	--	--	2.5E+02	2.1E+03	1.0E+02	7.1E+01
1,2-Dichloroethylene (cis)	--	--	--	--	1.0E+01	9.1E+01	--	9.0E+00
1,2-Dichloroethylene (trans)	--	--	--	--	1.0E+02	9.1E+02	--	9.0E+01
2,4-Dichlorophenol	--	--	--	--	1.5E+01	4.7E+01	--	1.1E+01
2,4-Dichlorophenoxy acetic acid (2,4-D)	--	--	--	--	5.0E+01	3.4E+02	--	4.4E+01
2,4-Dichlorophenoxy butyric acid (2,4-DB)	--	--	--	--	1.5E+02	4.5E+02	--	1.1E+02
Decabromodiphenyl ether (BDE-209)	1.1E+02	--	--	1.1E+02	3.5E+01	--	--	3.5E+01
1,2-Dichloropropane	2.1E+00	2.3E+01	1.5E+00	8.5E-01	2.0E+02	2.4E+03	2.1E+00	2.1E+00
2,3-Dichloropropanol	--	--	--	--	1.5E+01	1.2E+03	--	1.5E+01
1,3-Dichloropropene	7.8E-01	7.8E+00	1.4E+00	4.7E-01	1.5E+02	1.6E+03	1.0E+01	9.7E+00
Dichlorvos	2.7E-01	1.4E+01	--	2.6E-01	2.5E+00	1.4E+02	--	2.5E+00
Dicrotophos (Bidrin)	--	--	--	--	1.5E-01	8.3E+01	--	1.5E-01
Dicyclopentadiene	--	--	--	--	4.0E+02	8.8E+02	1.6E-01	1.6E-01
Dieldrin	4.9E-03	2.7E-03	--	1.8E-03	2.5E-01	1.5E-01	--	9.5E-02

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-3: GROUNDWATER REMEDIAL GOALS

CONTAMINANT	RESIDENTIAL GROUNDWATER							
	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Diethylene glycol, monobutyl ether	--	--	--	--	1.5E+02	2.2E+04	--	1.5E+02
Diethylene glycol, monoethyl ether	--	--	--	--	3.0E+02	1.9E+05	--	3.0E+02
Diethylformamide	--	--	--	--	5.0E+00	1.1E+03	--	5.0E+00
Di(2-ethylhexyl)adipate	6.5E+01	--	--	6.5E+01	3.0E+03	--	--	3.0E+03
Diethyl phthalate	--	--	--	--	4.0E+03	4.9E+04	--	3.7E+03
Diethylstilbestrol	2.2E-04	6.6E-05	--	5.1E-05	--	--	--	--
Difenzoquat (Avenge)	--	--	--	--	4.2E+02	1.9E+05	--	4.2E+02
Diflubenzuron	--	--	--	--	1.0E+02	2.6E+02	--	7.2E+01
1,1-Difluoroethane	--	--	--	--	--	--	2.1E+04	2.1E+04
Diisopropyl methylphosphonate (DIMP)	--	--	--	--	4.0E+02	3.2E+04	--	4.0E+02
Dimethipin	--	--	--	--	1.1E+02	6.6E+04	--	1.1E+02
Dimethoate	--	--	--	--	1.1E+01	1.8E+03	--	1.1E+01
3,3'-Dimethoxybenzidine	4.9E-02	1.6E+00	--	4.7E-02	--	--	--	--
N-N-Dimethylaniline	2.9E+00	2.0E+01	--	2.5E+00	1.0E+01	7.6E+01	--	8.9E+00
2,4-Dimethylaniline	3.9E-01	7.1E+00	--	3.7E-01	1.0E+01	2.0E+02	--	9.5E+00
2,4-Dimethylaniline hydrochloride	1.3E-01	5.2E+02	--	1.3E-01	--	--	--	--
3,3'-Dimethylbenzidine	7.1E-03	8.5E-02	--	6.5E-03	--	--	--	--
N,N-Dimethylformamide	--	--	--	--	5.0E+02	4.5E+05	1.6E+01	1.5E+01
2,4-Dimethylphenol	--	--	--	--	1.0E+02	7.8E+02	--	8.9E+01
2,6-Dimethylphenol	--	--	--	--	3.0E+00	2.1E+01	--	2.6E+00
3,4-Dimethylphenol	--	--	--	--	5.0E+00	4.3E+01	--	4.5E+00
Dimethyl terephthalate	--	--	--	--	5.0E+02	6.7E+03	--	4.7E+02
4,6-Dinitro-o-cyclohexyl phenol	--	--	--	--	1.0E+01	1.4E+01	--	5.8E+00
1,2-Dinitrobenzene	--	--	--	--	5.0E-01	1.3E+01	--	4.8E-01
1,3-Dinitrobenzene	--	--	--	--	5.0E-01	1.8E+01	--	4.9E-01
1,4-Dinitrobenzene	--	--	--	--	5.0E-01	1.9E+01	--	4.9E-01
2,4-Dinitrophenol	--	--	--	--	1.0E+01	3.0E+02	--	9.7E+00
Dinitrotoluene mixture	1.7E-01	2.6E-01	--	1.0E-01	4.5E+00	7.4E+00	--	2.8E+00
2,4-Dinitrotoluene	2.5E-01	4.3E+00	--	2.4E-01	1.0E+01	1.9E+02	--	9.5E+00
2,6-Dinitrotoluene	5.2E-02	7.4E-01	--	4.9E-02	1.5E+00	2.3E+01	--	1.4E+00
Dinoseb	--	--	--	--	5.0E+00	1.4E+01	--	3.7E+00
1,4-Dioxane	7.8E-01	2.3E+02	1.1E+00	4.6E-01	1.5E+02	4.8E+04	1.6E+01	1.4E+01
Diphenamid	--	--	--	--	1.5E+02	1.1E+03	--	1.3E+02
Diphenylamine	--	--	--	--	5.0E+02	8.4E+02	--	3.1E+02
N,N-Diphenyl-1,4 benzenediamine (DPPD)	--	--	--	--	1.5E+00	2.2E+00	--	9.0E-01

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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CONTAMINANT	RESIDENTIAL GROUNDWATER							
	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
1,2-Diphenylhydrazine	9.7E-02	3.9E-01	--	7.8E-02	--	--	--	--
Diphenyl sulfone	--	--	--	--	4.0E+00	5.0E+01	--	3.7E+00
Diquat dibromide (Diquat)	--	--	--	--	1.1E+01	--	--	1.1E+01
Direct black 38	1.1E-02	--	--	1.1E-02	--	--	--	--
Direct blue 6	1.1E-02	--	--	1.1E-02	--	--	--	--
Direct brown 95	1.2E-02	--	--	1.2E-02	--	--	--	--
Disulfoton	--	--	--	--	2.0E-01	3.3E-01	--	1.3E-01
1,4-Dithiane	--	--	--	--	5.0E+01	4.0E+03	--	5.0E+01
Diuron	--	--	--	--	1.0E+01	8.9E+01	--	9.0E+00
Dodine	--	--	--	--	1.0E+02	1.3E+04	--	1.0E+02
Endosulfan	--	--	--	--	3.0E+01	1.6E+02	--	2.5E+01
Endothall	--	--	--	--	1.0E+02	2.1E+03	--	9.6E+01
Endrin	--	--	--	--	1.5E+00	9.2E-01	--	5.7E-01
Enilconazole (Imazalil)	1.3E+00	3.1E+00	--	9.0E-01	1.3E+01	3.3E+01	--	9.1E+00
Epichlorohydrin	7.9E+00	7.9E+02	4.7E+00	2.9E+00	3.0E+01	3.3E+03	5.2E-01	5.1E-01
1,2-Epoxybutane	--	--	--	--	--	--	1.0E+01	1.0E+01
S-Ethyl dipropylthiocarbamate (EPTC)	--	--	--	--	2.5E+02	7.5E+02	--	1.9E+02
2-Chloroethyl phosphonic acid (Ethephon)	--	--	--	--	2.5E+01	1.1E+04	--	2.5E+01
Ethion	--	--	--	--	2.5E+00	1.9E+00	--	1.1E+00
2-Ethoxyethanol	--	--	--	--	4.5E+02	1.6E+05	1.0E+02	8.5E+01
2-Ethoxyethanol acetate	--	--	--	--	5.0E+02	5.7E+04	3.1E+01	2.9E+01
Ethyl acetate	--	--	--	--	4.5E+03	3.1E+05	3.7E+01	3.6E+01
Ethyl acrylate	--	--	--	--	2.5E+01	7.5E+02	4.2E+00	3.6E+00
Ethylbenzene	7.1E+00	1.2E+01	2.2E+00	1.5E+00	5.0E+02	9.5E+02	5.2E+02	2.0E+02
Ethyl chloride (Chloroethane)	--	--	--	--	--	--	5.2E+03	5.2E+03
Ethylene cyanohydrin	--	--	--	--	3.5E+02	2.8E+05	--	3.5E+02
Ethylene diamine	--	--	--	--	4.5E+02	--	--	4.5E+02
Ethylene glycol	--	--	--	--	1.0E+04	1.4E+07	--	1.0E+04
Ethylene glycol, monobutyl ether	--	--	--	--	5.0E+02	3.6E+04	--	4.9E+02
Ethylene oxide	8.1E-02	1.7E+01	6.8E-04	6.7E-04	--	--	1.6E+01	1.6E+01
Ethylene thiourea (ETU)	1.7E+00	1.0E+03	--	1.7E+00	4.0E-01	2.5E+02	--	4.0E-01
Ethyl ether	--	--	--	--	1.0E+03	4.9E+04	--	9.8E+02
Ethyl methacrylate	--	--	--	--	--	--	1.6E+02	1.6E+02
Ethyl p-nitrophenyl phenylphosphorothioate (EPN)	--	--	--	--	5.0E-02	4.0E-02	--	2.2E-02
Ethylphthalyl ethyl glycolate	--	--	--	--	1.5E+04	3.9E+05	--	1.4E+04

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-3: GROUNDWATER REMEDIAL GOALS

CONTAMINANT	RESIDENTIAL GROUNDWATER							
	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Fenamiphos	--	--	--	--	1.3E+00	8.4E+00	--	1.1E+00
Fenpropathrin (Danitol)	--	--	--	--	1.3E+02	1.8E+01	--	1.6E+01
Fenvalerate (Pydrin)	--	--	--	--	1.3E+02	--	--	1.3E+02
Fluometuron	--	--	--	--	6.5E+01	8.6E+02	--	6.1E+01
Fluoride	--	--	--	--	2.0E+02	4.6E+04	--	2.0E+02
Fluoridone	--	--	--	--	4.0E+02	3.5E+03	--	3.6E+02
Flurprimidol	--	--	--	--	2.0E+02	1.2E+03	--	1.7E+02
Flusilazole (NuStar)	--	--	--	--	1.0E+01	3.5E+01	--	7.8E+00
Flutolanil	--	--	--	--	2.5E+03	9.3E+03	--	2.0E+03
Fluvalinate	--	--	--	--	5.0E+01	--	--	5.0E+01
Folpet	--	--	--	--	4.5E+02	4.7E+03	--	4.1E+02
Fomesafen	--	--	--	--	1.3E+01	3.0E+02	--	1.2E+01
Fonofos	--	--	--	--	1.0E+01	1.6E+01	--	6.1E+00
Formaldehyde	--	--	4.3E-01	4.3E-01	1.0E+03	8.0E+04	5.1E+00	5.1E+00
Formic acid	--	--	--	--	4.5E+03	1.6E+06	1.6E-01	1.6E-01
Fosetyl-al	--	--	--	--	1.3E+04	--	--	1.3E+04
Furan	--	--	--	--	5.0E+00	1.2E+02	--	4.8E+00
Furazolidone	2.1E-02	1.0E+01	--	2.0E-02	--	--	--	--
Furfural	--	--	--	--	1.5E+01	1.8E+03	2.6E+01	9.5E+00
Furmecyclox	2.6E+00	2.0E+00	--	1.1E+00	--	--	--	--
Furothiazole (Furium)	5.2E-02	1.9E+00	--	5.1E-02	--	--	--	--
Glufosinate-ammonium	--	--	--	--	3.0E+01	--	--	3.0E+01
Glycidaldehyde	--	--	--	--	2.0E+00	4.5E+02	5.2E-01	4.1E-01
Glyphosate	--	--	--	--	5.0E+02	--	--	5.0E+02
Haloxyfop-methyl	--	--	--	--	2.5E-01	7.7E-01	--	1.9E-01
Thifensulfuron-methyl (Harmony)	--	--	--	--	2.2E+02	2.9E+04	--	2.1E+02
Heptachlor	1.7E-02	2.3E-03	4.3E-03	1.4E-03	2.5E+00	3.7E-01	--	3.2E-01
Heptachlor epoxide	8.6E-03	7.1E-03	2.2E-03	1.4E-03	6.5E-02	5.9E-02	--	3.1E-02
Hexabromobenzene	--	--	--	--	1.0E+01	--	--	1.0E+01
Hexachlorobenzene	4.9E-02	--	1.2E-02	9.8E-03	4.0E+00	--	--	4.0E+00
Hexachlorobutadiene	1.0E+00	4.4E-01	2.6E-01	1.4E-01	5.0E+00	2.4E+00	--	1.6E+00
alpha-Hexachlorocyclohexane (alpha-HCH)	1.2E-02	1.8E-02	--	7.2E-03	4.0E+01	6.2E+01	--	2.4E+01
beta-Hexachlorocyclohexane (beta-HCH)	4.3E-02	6.1E-02	--	2.5E-02	--	--	--	--
gamma-Hexachlorocyclohexane (Lindane)	7.1E-02	1.0E-01	--	4.2E-02	1.5E+00	2.3E+00	--	9.1E-01
Hexachlorocyclohexane technical	4.3E-02	6.1E-02	--	2.5E-02	--	--	--	--

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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CONTAMINANT	RESIDENTIAL GROUNDWATER							
	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Hexachlorocyclopentadiene	--	--	--	--	3.0E+01	1.0E+01	1.0E-01	1.0E-01
Hexachloroethane	1.9E+00	1.7E+00	5.1E-01	3.3E-01	3.5E+00	3.4E+00	1.6E+01	1.6E+00
Hexachlorophene	--	--	--	--	1.5E+00	--	--	1.5E+00
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX/Cyclonite)	7.1E-01	8.6E+01	--	7.0E-01	1.5E+01	2.0E+03	--	1.5E+01
1,6-Hexamethylene diisocyanate	--	--	--	--	--	--	5.2E-03	5.2E-03
n-Hexane	--	--	--	--	--	--	3.7E+02	3.7E+02
Hexazinone	--	--	--	--	1.7E+02	5.9E+03	--	1.6E+02
Hexythiazox (Savey)	--	--	--	--	1.3E+02	3.6E+01	--	2.8E+01
Hydramethylnon (Amdro)	--	--	--	--	8.5E+01	7.3E+03	--	8.4E+01
Hydrazine, hydrazine sulfate	2.6E-02	7.6E+01	1.1E-03	1.1E-03	--	--	1.6E-02	1.6E-02
Hydrazine, dimethyl	--	--	--	--	5.0E-01	8.7E+02	1.0E-03	1.0E-03
Hydrogen chloride	--	--	--	--	--	--	1.0E+01	1.0E+01
Hydrogen sulfide	--	--	--	--	--	--	1.0E+00	1.0E+00
p-Hydroquinone	1.3E+00	1.2E+02	--	1.3E+00	2.0E+02	2.0E+04	--	2.0E+02
Imazaquin	--	--	--	--	1.3E+03	6.5E+04	--	1.2E+03
Imazethapyr (Pursuit)	--	--	--	--	1.3E+04	1.8E+05	--	1.2E+04
Iprodione	--	--	--	--	2.0E+02	2.3E+03	--	1.8E+02
Iron	--	--	--	--	3.5E+03	8.0E+05	--	3.5E+03
Isobutanol (Isobutyl alcohol)	--	--	--	--	1.5E+03	9.0E+04	--	1.5E+03
Isophorone	8.2E+01	1.6E+03	--	7.8E+01	1.0E+03	2.2E+04	--	9.6E+02
Isopropalin	--	--	--	--	7.5E+01	1.1E+01	--	1.0E+01
Isopropyl methyl phosphonic acid	--	--	--	--	5.0E+02	9.7E+04	--	5.0E+02
Isoxaben	--	--	--	--	2.5E+02	6.9E+02	--	1.8E+02
Lactofen	--	--	--	--	4.0E+01	6.7E+01	--	2.5E+01
Lead +++	--	--	--	--	--	--	--	--
Lead (tetraethyl)	--	--	--	--	5.0E-04	9.4E-04	--	3.3E-04
Linuron	--	--	--	--	3.9E+01	1.9E+02	--	3.2E+01
Lithium	--	--	--	--	1.0E+01	2.3E+03	--	1.0E+01
Malathion	--	--	--	--	1.0E+02	2.7E+03	--	9.7E+01
Maleic anhydride	--	--	--	--	5.0E+02	9.4E+03	--	4.8E+02
Maleic hydrazide	--	--	--	--	2.5E+03	2.2E+06	--	2.5E+03
Malononitrile	--	--	--	--	5.0E-01	2.3E+02	--	5.0E-01
Mancozeb	--	--	--	--	1.5E+02	1.2E+03	--	1.3E+02
Maneb	--	--	--	--	2.5E+01	9.0E+02	--	2.4E+01
Manganese (non-food) +++	--	--	--	--	7.0E+02	--	--	7.0E+02

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-3: GROUNDWATER REMEDIAL GOALS

CONTAMINANT	RESIDENTIAL GROUNDWATER							
	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Mephosfolan	--	--	--	--	4.5E-01	6.2E+01	--	4.5E-01
Mepiquat chloride (Mepiquat)	--	--	--	--	1.5E+02	--	--	1.5E+02
Mercury and compounds	--	--	--	--	1.5E+00	2.4E+01	--	1.4E+00
Mercury (elemental)	--	--	--	--	--	--	1.6E-01	1.6E-01
Mercury (methyl)	--	--	--	--	5.0E-01	2.3E+01	--	4.9E-01
Merphos	--	--	--	--	1.5E-01	--	--	1.5E-01
Merphos oxide	--	--	--	--	5.0E-01	8.3E-02	--	7.1E-02
Metalaxyl	--	--	--	--	3.0E+02	1.6E+04	--	3.0E+02
Methacrylonitrile	--	--	--	--	5.0E-01	3.3E+01	1.6E+01	4.8E-01
Methamidophos	--	--	--	--	2.5E-01	2.5E+02	--	2.5E-01
Methanol	--	--	--	--	1.0E+04	4.5E+06	1.0E+04	5.1E+03
Methidathion	--	--	--	--	7.5E+00	2.2E+02	--	7.3E+00
Methomyl	--	--	--	--	1.3E+02	1.7E+04	--	1.2E+02
Methoxychlor	--	--	--	--	2.5E+01	1.5E+01	--	9.3E+00
2-Methoxyethanol	--	--	--	--	2.5E+01	1.6E+04	1.0E+01	7.4E+00
2-Methoxyethanol acetate	--	--	--	--	4.0E+01	8.8E+03	5.2E-01	5.1E-01
2-Methoxy-5-nitroaniline	1.6E+00	5.4E+01	--	1.5E+00	--	--	--	--
Methyl acetate	--	--	--	--	5.0E+03	7.3E+05	--	5.0E+03
Methyl acrylate	--	--	--	--	--	--	1.0E+01	1.0E+01
2-Methylaniline hydrochloride	6.0E-01	3.9E+03	--	6.0E-01	--	--	--	--
Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	--	--	--	--	2.5E+02	7.6E+03	--	2.4E+02
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	--	--	--	--	2.5E+00	7.6E+00	--	1.9E+00
4-(2-Methyl-4-chlorophenoxy) butyric acid (MCPB)	--	--	--	--	2.2E+01	6.0E+01	--	1.6E+01
2-(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)	--	--	--	--	5.0E+00	1.8E+01	--	3.9E+00
4,4'-Methylenebisbenzeneamine	4.9E-02	1.7E+00	--	4.7E-02	--	--	--	--
4,4'-Methylene bis(2-chloroaniline)	2.5E-01	4.3E-01	--	1.6E-01	1.0E+01	1.9E+01	--	6.5E+00
4,4'-Methylene bis(N,N'-dimethyl)aniline	1.7E+00	6.7E-01	--	4.8E-01	--	--	--	--
Methylene bromide	--	--	--	--	--	--	2.1E+00	2.1E+00
Methylene chloride	1.3E+01	3.5E+02	2.0E+02	1.1E+01	3.0E+01	9.1E+02	3.1E+02	2.7E+01
4,4'-Methylenediphenyl isocyanate	--	--	--	--	--	--	--	--
2-(1-Methylethoxy)phenol methylcarbamate (Baygon)	--	--	--	--	2.0E+01	9.0E+02	--	2.0E+01
Methyl ethyl ketone (2-Butanone)	--	--	--	--	3.0E+03	3.7E+05	2.6E+03	1.4E+03
Methyl isobutyl ketone (4-Methyl-2-pentanone)	--	--	--	--	--	--	1.6E+03	1.6E+03
Methyl methacrylate	--	--	--	--	7.0E+03	1.9E+05	3.7E+02	3.5E+02
2-Methyl-5-nitroaniline	8.7E+00	1.4E+02	--	8.2E+00	1.0E+02	1.8E+03	--	9.5E+01

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Methyl parathion	--	--	--	--	1.3E+00	1.0E+01	--	1.1E+00
2-Methylphenol	--	--	--	--	2.5E+02	3.0E+03	--	2.3E+02
3-Methylphenol	--	--	--	--	2.5E+02	3.0E+03	--	2.3E+02
4-Methylphenol	--	--	--	--	5.0E+02	6.2E+03	--	4.6E+02
Methyl phosphonic acid	--	--	--	--	3.0E+02	3.1E+05	--	3.0E+02
Methyl styrene (mixture)	--	--	--	--	3.0E+01	1.1E+01	2.1E+01	5.7E+00
Methyl styrene (alpha)	--	--	--	--	3.5E+02	4.4E+02	--	1.9E+02
Methyl tertbutyl ether (MTBE)	4.3E+01	2.0E+03	2.2E+01	1.4E+01	--	--	1.6E+03	1.6E+03
Metolaclor (Dual)	--	--	--	--	7.5E+02	6.6E+03	--	6.8E+02
Metribuzin	--	--	--	--	1.3E+02	4.4E+03	--	1.2E+02
Metsulfuron-methyl (Ally)	--	--	--	--	1.3E+03	6.1E+04	--	1.2E+03
Mirex	4.3E-03	--	1.1E-03	8.8E-04	1.0E+00	--	--	1.0E+00
Molinate	--	--	--	--	1.0E+01	3.0E+01	--	7.5E+00
Molybdenum	--	--	--	--	2.5E+01	2.5E+03	--	2.5E+01
Monochloramine	--	--	--	--	5.0E+02	6.5E+04	--	5.0E+02
Myclobutanil (Systhane)	--	--	--	--	1.3E+02	1.2E+03	--	1.1E+02
Naled	--	--	--	--	1.0E+01	1.7E+03	--	1.0E+01
Napropamide	--	--	--	--	6.0E+02	2.7E+03	--	4.9E+02
Nickel and compounds	--	--	--	--	1.0E+02	4.6E+03	--	9.8E+01
Nickel refinery dust	--	--	--	--	5.5E+01	2.5E+03	--	5.4E+01
Nickel subsulfide	4.6E-02	1.7E+00	--	4.5E-02	5.5E+01	2.5E+03	--	5.4E+01
Nitrate	--	--	--	--	8.0E+03	1.8E+06	--	8.0E+03
Nitrite	--	--	--	--	5.0E+02	1.1E+05	--	5.0E+02
2-Nitroaniline	--	--	--	--	5.0E+01	8.6E+02	--	4.7E+01
Nitrobenzene	--	--	1.4E-01	1.4E-01	1.0E+01	1.6E+02	4.7E+00	3.1E+00
Nitrofurantoin	--	--	--	--	3.5E+02	4.0E+05	--	3.5E+02
Nitrofurazone	6.0E-02	1.7E+01	--	6.0E-02	--	--	--	--
Nitroglycerin	4.6E+00	1.8E+02	--	4.5E+00	5.0E-01	2.2E+01	--	4.9E-01
Nitroguanidine	--	--	--	--	5.0E+02	4.5E+05	--	5.0E+02
2-Nitropropane	--	--	2.1E-03	2.1E-03	--	--	1.0E+01	1.0E+01
N-Nitrosodi-n-butylamine	1.4E-02	7.9E-02	3.5E-03	2.7E-03	--	--	--	--
N-Nitrosodiethanolamine	2.8E-02	8.1E+01	--	2.8E-02	--	--	--	--
N-Nitrosodiethylamine	1.7E-04	1.7E-02	--	1.7E-04	--	--	--	--
N-Nitrosodimethylamine	4.9E-04	2.0E-01	1.4E-04	1.1E-04	4.0E-02	1.8E+01	2.1E-02	1.4E-02
N-Nitrosodiphenylamine	1.6E+01	5.2E+01	--	1.2E+01	--	--	--	--

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	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
N-Nitroso di-n-propylamine	1.1E-02	3.5E-01	--	1.1E-02	--	--	--	--
N-Nitroso-N-methylethylamine	3.5E-03	6.4E-01	8.9E-04	7.1E-04	--	--	--	--
N-Nitrosopyrrolidine	3.7E-02	1.0E+01	--	3.7E-02	--	--	--	--
m-Nitrotoluene	--	--	--	--	5.0E-01	3.4E+00	--	4.4E-01
o-Nitrotoluene	3.5E-01	2.8E+00	--	3.1E-01	4.5E+00	3.9E+01	--	4.0E+00
p-Nitrotoluene	4.9E+00	3.4E+01	--	4.3E+00	2.0E+01	1.5E+02	--	1.8E+01
Norflurazon	--	--	--	--	7.5E+01	1.9E+03	--	7.2E+01
Octabromodiphenyl ether	--	--	--	--	1.5E+01	--	--	1.5E+01
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	--	--	--	--	2.5E+02	1.6E+05	--	2.5E+02
Octamethylpyrophosphoramide	--	--	--	--	1.0E+01	3.6E+04	--	1.0E+01
Oryzalin	1.0E+01	3.8E+01	--	7.9E+00	7.0E+02	2.9E+03	--	5.7E+02
Oxadiazon	--	--	--	--	2.5E+01	2.2E+01	--	1.2E+01
Oxamyl	--	--	--	--	1.3E+02	1.3E+05	--	1.3E+02
Oxyfluorfen	1.1E+00	1.1E+00	--	5.4E-01	1.5E+02	1.7E+02	--	7.9E+01
Paclobutrazol	--	--	--	--	6.5E+01	4.3E+02	--	5.7E+01
Paraquat	--	--	--	--	2.3E+01	--	--	2.3E+01
Parathion	--	--	--	--	3.0E+01	7.4E+01	--	2.1E+01
Pebulate	--	--	--	--	2.5E+02	3.2E+02	--	1.4E+02
Pendimethalin	--	--	--	--	1.5E+02	4.4E+01	--	3.4E+01
Pentabromo-6-chloro cyclohexane	3.9E+00	9.6E+00	--	2.8E+00	1.0E+02	2.7E+02	--	7.3E+01
Pentabromodiphenyl ether	--	--	--	--	1.0E+01	--	--	1.0E+01
Pentachlorobenzene	--	--	--	--	4.0E+00	9.8E-01	--	7.9E-01
Pentachloronitrobenzene	3.0E-01	2.0E-01	--	1.2E-01	1.5E+01	1.1E+01	--	6.4E+00
Pentachlorophenol	1.9E-01	5.2E-02	--	4.1E-02	2.5E+01	7.3E+00	--	5.7E+00
Perchlorate	--	--	--	--	3.5E+00	8.0E+02	--	3.5E+00
Perfluoroalkyl Compounds								
Perfluoro-octanesulfonate (PFOS)^^	--	--	--	--	1.0E+00	--	--	1.0E+00
Perfluorooctanoic acid (PFOA)^^	1.1E+00	--	--	1.1E+00	1.0E-01	--	--	1.0E-01
Permethrin	--	--	--	--	2.5E+02	--	--	2.5E+02
Phenmedipham	--	--	--	--	1.2E+03	4.6E+03	--	9.5E+02
Phenol	--	--	--	--	1.5E+03	3.5E+04	--	1.4E+03
m-Phenylenediamine	--	--	--	--	3.0E+01	1.2E+04	--	3.0E+01
p-Phenylenediamine	--	--	--	--	5.0E+00	1.9E+03	--	5.0E+00
Phenylmercuric acetate	--	--	--	--	4.0E-01	1.4E+02	--	4.0E-01
2-Phenylphenol	4.1E+01	1.2E+02	--	3.1E+01	--	--	--	--

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	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Phorate	--	--	--	--	1.0E+00	3.1E+00	--	7.6E-01
Phosmet	--	--	--	--	1.0E+02	1.3E+03	--	9.3E+01
Phosphine	--	--	--	--	1.5E+00	2.1E+02	1.6E-01	1.4E-01
Phosphoric acid	--	--	--	--	2.5E+05	2.4E+07	--	2.4E+05
Phosphorus (white)	--	--	--	--	1.0E-01	1.4E+01	--	1.0E-01
p-Phthalic acid	--	--	--	--	5.0E+03	8.2E+04	--	4.7E+03
Phthalic anhydride	--	--	--	--	1.0E+04	2.7E+05	--	9.7E+03
Picloram	--	--	--	--	3.5E+02	1.1E+04	--	3.4E+02
Pirimiphos-methyl	--	--	--	--	3.5E-01	5.4E-01	--	2.1E-01
Polybrominated biphenyls (PBBs)	2.6E-03	--	--	2.6E-03	3.5E-02	--	--	3.5E-02
Polychlorinated biphenyls (PCBs)	3.9E-02	--	9.9E-03	7.9E-03	--	--	--	--
Aroclor 1016	1.1E+00	--	--	1.1E+00	3.5E-01	--	--	3.5E-01
Aroclor 1221	3.9E-02	1.2E-02	9.9E-03	4.7E-03	--	--	--	--
Aroclor 1232	3.9E-02	1.2E-02	9.9E-03	4.7E-03	--	--	--	--
Aroclor 1242	3.9E-02	--	9.9E-03	7.9E-03	--	--	--	--
Aroclor 1248	3.9E-02	--	9.9E-03	7.9E-03	--	--	--	--
Aroclor 1254	3.9E-02	--	9.9E-03	7.9E-03	1.0E-01	--	--	1.0E-01
Aroclor 1260	3.9E-02	--	9.9E-03	7.9E-03	--	--	--	--

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Polynuclear aromatic hydrocarbons (PAHs)								
Acenaphthene	--	--	--	--	3.0E+02	2.4E+02	--	1.3E+02
Anthracene								
Benz[a]anthracene	2.5E-01	--	3.4E-02	3.0E-02	--	--	--	--
Benzo[a]pyrene	2.5E-02	--	--	2.5E-02	1.5E+00	--	--	1.5E+00
Benzo[b]fluoranthene	2.5E-01	--	--	2.5E-01	--	--	--	--
Benzo[k]fluoranthene	2.5E+00	--	--	2.5E+00	--	--	--	--
Chrysene	2.5E+01	--	--	2.5E+01	--	--	--	--
Dibenz[ah]anthracene	2.5E-02	--	--	2.5E-02	--	--	--	--
Fluoranthene	--	--	--	--	2.0E+02	--	--	2.0E+02
Fluorene	--	--	--	--	2.0E+02	1.2E+02	--	7.4E+01
Indeno[1,2,3-cd]pyrene	2.5E-01	--	--	2.5E-01	--	--	--	--
Naphthalene	--	--	1.7E-01	1.7E-01	1.0E+02	1.8E+02	1.6E+00	1.5E+00
Pyrene	--	--	--	--	1.5E+02	3.8E+01	--	3.0E+01
Prochloraz	5.2E-01	1.4E+00	--	3.8E-01	4.5E+01	1.3E+02	--	3.3E+01
Profluralin	--	--	--	--	3.0E+01	8.3E+00	--	6.5E+00
Prometon	--	--	--	--	7.5E+01	4.0E+02	--	6.3E+01
Prometryn	--	--	--	--	2.0E+02	5.9E+02	--	1.5E+02
Propyzamide (Pronamide)	--	--	--	--	3.8E+02	1.4E+03	--	2.9E+02
Propachlor	--	--	--	--	6.5E+01	1.1E+03	--	6.1E+01
Propanil	--	--	--	--	2.5E+01	1.1E+02	--	2.0E+01
Propargite	4.1E-01	2.6E-01	--	1.6E-01	2.0E+02	1.4E+02	--	8.1E+01
Propargyl alcohol	--	--	--	--	1.0E+01	3.0E+03	--	1.0E+01
Propazine	--	--	--	--	1.0E+02	6.0E+02	--	8.6E+01
Propham	--	--	--	--	1.0E+02	7.1E+02	--	8.8E+01
Propiconazole	--	--	--	--	5.0E+02	2.0E+03	--	4.0E+02
n-Propylbenzene	--	--	--	--	5.0E+02	4.6E+02	5.2E+02	1.6E+02
Propylene glycol	--	--	--	--	1.0E+05	8.0E+07	--	1.0E+05
Propylene glycol, monoethyl ether	--	--	--	--	3.5E+03	9.8E+05	1.0E+03	8.0E+02
Propylene glycol, monomethyl ether	--	--	--	--	3.5E+03	9.8E+05	1.0E+03	8.0E+02
Propylene oxide	3.2E-01	8.4E+01	1.5E+00	2.7E-01	--	--	1.6E+01	1.6E+01
Pyridine	--	--	--	--	5.0E+00	3.7E+02	--	4.9E+00
Quinalphos	--	--	--	--	2.5E+00	2.6E+00	--	1.3E+00
Quinoline	2.6E-02	2.9E-01	--	2.4E-02	--	--	--	--
Resmethrin	--	--	--	--	1.5E+02	1.9E+01	--	1.7E+01

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Ronnel	--	--	--	--	2.5E+02	1.7E+02	--	1.0E+02
Rotenone	--	--	--	--	2.0E+01	6.4E+01	--	1.5E+01
Selenious Acid	--	--	--	--	2.5E+01	5.7E+03	--	2.5E+01
Selenium	--	--	--	--	2.5E+01	5.7E+03	--	2.5E+01
Sethoxydim	--	--	--	--	7.0E+02	9.5E+02	--	4.0E+02
Silver and compounds	--	--	--	--	2.5E+01	3.8E+02	--	2.4E+01
Simazine	6.5E-01	9.3E+00	--	6.1E-01	2.5E+01	3.9E+02	--	2.4E+01
Sodium azide	--	--	--	--	2.0E+01	2.5E+03	--	2.0E+01
Sodium diethyldithiocarbamate	2.9E-01	8.5E+02	--	2.9E-01	1.5E+02	4.8E+05	--	1.5E+02
Sodium fluoroacetate	--	--	--	--	1.0E-01	--	--	1.0E-01
Sodium metavanadate	--	--	--	--	5.0E+00	4.3E+02	--	5.0E+00
Strontium, stable	--	--	--	--	3.0E+03	6.8E+05	--	3.0E+03
Strychnine	--	--	--	--	1.5E+00	8.1E+01	--	1.5E+00
Styrene	--	--	--	--	1.0E+03	2.6E+03	5.2E+02	3.0E+02
1,1'-Sulfonylbis (4-Chlorobenzene)	--	--	--	--	4.0E+00	8.7E+00	--	2.7E+00
Tebuthiuron	--	--	--	--	3.5E+02	1.2E+04	--	3.4E+02
Temephos	--	--	--	--	1.0E+02	--	--	1.0E+02
Terbacil	--	--	--	--	6.5E+01	1.7E+03	--	6.3E+01
Terbufos	--	--	--	--	1.3E-01	1.1E-01	--	5.9E-02
Terbutryn	--	--	--	--	5.0E+00	1.0E+01	--	3.4E+00
1,2,4,5-Tetrachlorobenzene	--	--	--	--	1.5E+00	5.9E-01	--	4.3E-01
2,3,7,8-Tetrachlorodibenzo-p-dioxin (Dioxin)	6.0E-07	--	1.5E-07	1.2E-07	3.5E-06	--	2.1E-05	3.0E-06
1,1,1,2-Tetrachloroethane	3.0E+00	1.1E+01	7.6E-01	5.7E-01	1.5E+02	6.0E+02	--	1.2E+02
1,1,2,2-Tetrachloroethane	3.9E-01	3.3E+00	9.7E-02	7.6E-02	1.0E+02	9.1E+02	--	9.0E+01
Tetrachloroethylene (PCE)	3.7E+01	6.5E+01	2.2E+01	1.1E+01	3.0E+01	5.8E+01	2.1E+01	1.0E+01
2,3,4,6-Tetrachlorophenol	--	--	--	--	1.5E+02	9.8E+01	--	5.9E+01
p,a,a,a-Tetrachlorotoluene	3.9E-03	2.0E-03	--	1.3E-03	--	--	--	--
Tetrachlorovinphos (Stirofos)	3.2E+00	1.9E+01	--	2.8E+00	1.5E+02	9.6E+02	--	1.3E+02
Tetraethyldithiopyrophosphate	--	--	--	--	2.5E+00	6.0E+00	--	1.8E+00
Thallium and compounds	--	--	--	--	5.0E-02	1.1E+01	--	5.0E-02
Thiobencarb	--	--	--	--	5.0E+01	1.9E+02	--	4.0E+01
Thiofanox	--	--	--	--	1.5E+00	1.1E+01	--	1.3E+00
Thiophanate-methyl	6.5E+00	7.6E+02	--	6.4E+00	1.4E+02	1.7E+04	--	1.3E+02
Thiram	--	--	--	--	7.5E+01	3.0E+03	--	7.3E+01
Tin and compounds	--	--	--	--	3.0E+03	6.8E+05	--	3.0E+03

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-3: GROUNDWATER REMEDIAL GOALS

CONTAMINANT	RESIDENTIAL GROUNDWATER							
	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Toluene	--	--	--	--	4.0E+02	1.3E+03	2.6E+03	2.8E+02
p-Toluidine	2.6E+00	6.8E+01	--	2.5E+00	2.0E+01	5.7E+02	--	1.9E+01
Tralomethrin	--	--	--	--	3.8E+01	--	--	3.8E+01
Triadimefon (Bayleton)	--	--	--	--	1.7E+02	2.0E+03	--	1.6E+02
Triallate	1.1E+00	8.3E-01	--	4.7E-01	1.3E+02	1.0E+02	--	5.7E+01
Triasulfuron	--	--	--	--	5.0E+01	1.5E+04	--	5.0E+01
Tribenuron-methyl (Express)	--	--	--	--	4.0E+01	1.2E+03	--	3.9E+01
1,2,4-Tribromobenzene	--	--	--	--	2.5E+01	2.0E+01	--	1.1E+01
Tributyltin oxide (TBTO)	--	--	--	--	1.5E+00	2.4E+01	--	1.4E+00
2,4,6-Trichloroaniline	1.1E+01	2.0E+01	--	7.1E+00	1.5E-01	2.9E-01	--	9.9E-02
2,4,6-Trichloroaniline hydrochloride	2.7E+00	3.7E+03	--	2.7E+00	--	--	--	--
1,2,4-Trichlorobenzene	2.7E+00	2.0E+00	--	1.2E+00	5.0E+01	4.1E+01	1.0E+00	1.0E+00
1,1,1-Trichloroethane	--	--	--	--	1.0E+04	6.3E+04	2.6E+03	2.0E+03
1,1,2-Trichloroethane	1.4E+00	2.0E+01	3.5E-01	2.8E-01	2.0E+01	3.1E+02	1.0E-01	1.0E-01
Trichloroethylene (TCE) Long-term +++	5.4E-01	3.4E+00	4.9E-01	2.4E-01	2.5E+00	1.7E+01	1.0E+00	7.1E-01
Trichloroethylene (TCE) Short-term ‡	--	--	--	--	--	--	--	--
Trichlorofluoromethane	--	--	--	--	1.5E+03	9.1E+03	--	1.3E+03
2,4,5-Trichlorophenol	--	--	--	--	5.0E+02	7.2E+02	--	3.0E+02
2,4,6-Trichlorophenol	7.1E+00	9.8E+00	--	4.1E+00	5.0E+00	7.5E+00	--	3.0E+00
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	--	--	--	--	5.0E+01	2.2E+02	--	4.1E+01
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	--	--	--	--	4.0E+01	9.1E+01	--	2.8E+01
1,1,2-Trichloropropane	--	--	--	--	2.5E+01	1.9E+02	--	2.2E+01
1,2,3-Trichloropropane	8.4E-04	7.3E-03	--	7.5E-04	2.0E+01	1.9E+02	1.6E-01	1.6E-01
1,2,3-Trichloropropene	--	--	--	--	1.5E+01	6.5E+01	1.6E-01	1.5E-01
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	--	--	--	--	1.5E+05	4.8E+05	2.6E+03	2.5E+03
Tridiphane	--	--	--	--	1.5E+01	6.4E+00	--	4.5E+00
Triethylamine	--	--	--	--	--	--	3.7E+00	3.7E+00
Trifluralin	1.0E+01	3.4E+00	--	2.6E+00	3.8E+01	1.4E+01	--	1.0E+01
1,2,4-Trimethylbenzene	--	--	--	--	5.0E+01	5.0E+01	3.1E+01	1.4E+01
1,3,5-Trimethylbenzene	--	--	--	--	5.0E+01	6.9E+01	3.1E+01	1.5E+01
Trimethyl phosphate	3.9E+00	2.8E+03	--	3.9E+00	5.0E+01	4.0E+04	--	5.0E+01
1,3,5-Trinitrobenzene	--	--	--	--	1.5E+02	1.2E+04	--	1.5E+02
Trinitrophenylmethylnitramine (Tetryl)	--	--	--	--	1.0E+01	6.2E+02	--	9.9E+00
2,4,6-Trinitrotoluene (TNT)	2.6E+00	1.1E+02	--	2.5E+00	2.5E+00	1.1E+02	--	2.5E+00
Triphenylphosphine oxide	--	--	--	--	1.0E+02	9.5E+02	--	9.1E+01

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-3: GROUNDWATER REMEDIAL GOALS

CONTAMINANT	RESIDENTIAL GROUNDWATER							
	Cancer Risk = 1E-06				Chronic HQ = 0.25			
	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)	water-ingest (µg/L)	water-derm (µg/L)	water-inhale (µg/L)	combined (µg/L)
Tris(2-chloroethyl) phosphate	3.9E+00	3.0E+02	--	3.8E+00	3.5E+01	2.9E+03	--	3.5E+01
Uranium (chemical toxicity only)	--	--	--	--	1.0E+00	4.0E+01	--	9.8E-01
Vanadium and compounds +++	--	--	--	--	2.5E+01	1.5E+02	--	2.1E+01
Vernolate (Vernam)	--	--	--	--	5.0E+00	6.2E+00	--	2.8E+00
Vinclozolin	--	--	--	--	6.0E+00	4.4E+01	--	5.3E+00
Vinyl acetate	--	--	--	--	5.0E+03	3.4E+05	1.0E+02	1.0E+02
Vinyl bromide	--	--	1.8E-01	1.8E-01	--	--	1.6E+00	1.6E+00
Vinyl chloride +++	3.5E-02	4.5E-01	4.6E-01	3.0E-02	1.5E+01	2.2E+02	5.2E+01	1.1E+01
Warfarin	--	--	--	--	1.5E+00	2.1E+01	--	1.4E+00
Xylenes	--	--	--	--	1.0E+03	1.9E+03	5.2E+01	4.8E+01
Zinc	--	--	--	--	1.5E+03	5.7E+05	--	1.5E+03
Zinc phosphide	--	--	--	--	1.5E+00	5.7E+02	--	1.5E+00
Zineb	--	--	--	--	2.5E+02	2.4E+04	--	2.5E+02

Notes:

* At VCP sites where chromium is a potential contaminant of concern, such as a former metal plating facility, the VCP applicant should collect media samples for both Chromium III and Chromium VI analyses.

+++ See Section 5.4 of Appendix A, Protocol for VCP Remediation Goal Lookup Tables, Nebraska Voluntary Cleanup Program for more information.

µg/L = microgram per liter
HQ = Hazard quotient
water-dermal = water dermal pathway
water-ingest = water ingestion pathway
water-inhale = vapors from water inhalation pathway (domestic use)

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Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL SOIL							
		Cancer Risk = 1E-06				Chronic HQ = 0.25			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Acephate	30560-19-1	--	--	--	--	2.3E+01	9.9E+01	--	1.9E+01
Acetaldehyde	75-07-0	--	--	1.1E+01	1.1E+01	--	--	2.0E+01	2.0E+01
Acetochlor	34256-82-1	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
Acetone	67-64-1	--	--	--	--	1.8E+04	--	1.1E+05	1.5E+04
Acetone cyanohydrin	75-86-5	--	--	--	--	--	--	1.0E+06	1.0E+06
Acetonitrile	75-05-8	--	--	--	--	--	--	2.0E+02	2.0E+02
Acrolein	107-02-8	--	--	--	--	9.8E+00	--	3.6E-02	3.6E-02
Acrylamide	79-06-1	3.1E-01	1.2E+00	2.0E+04	2.4E-01	3.9E+01	1.6E+02	3.1E+06	3.2E+01
Acrylic acid	79-10-7	--	--	--	--	9.8E+03	--	2.5E+01	2.5E+01
Acrylonitrile	107-13-1	1.3E+00	--	3.2E-01	2.5E-01	7.8E+02	--	4.0E+00	4.0E+00
Alachlor	15972-60-8	1.2E+01	4.4E+01	--	9.7E+00	2.0E+02	8.2E+02	--	1.6E+02
Aldicarb	116-06-3	--	--	--	--	2.0E+01	8.2E+01	--	1.6E+01
Aldicarb sulfone	1646-88-4	--	--	--	--	2.0E+01	8.2E+01	--	1.6E+01
Aldrin	309-00-2	4.1E-02	--	9.8E-01	3.9E-02	5.9E-01	--	--	5.9E-01
Allyl alcohol	107-18-6	--	--	--	--	9.8E+01	--	8.9E-01	8.8E-01
Allyl chloride	107-05-1	3.3E+01	--	7.4E-01	7.2E-01	--	--	4.1E-01	4.1E-01
Aluminum	7429-90-5	--	--	--	--	2.0E+04	--	2.6E+06	1.9E+04
Aluminum phosphide	20859-73-8	--	--	--	--	7.8E+00	--	--	7.8E+00
Ametryn	834-12-8	--	--	--	--	1.8E+02	7.4E+02	--	1.4E+02
m-Aminophenol	591-27-5	--	--	--	--	1.6E+03	6.6E+03	--	1.3E+03
Amitraz	33089-61-1	--	--	--	--	4.9E+01	2.1E+02	--	4.0E+01
Ammonia +++	7664-41-7	--	--	--	--	--	--	2.6E+08	2.6E+08
Ammonium sulfamate	7773-06-0	--	--	--	--	3.9E+03	--	--	3.9E+03
Aniline	62-53-3	1.2E+02	4.3E+02	3.5E+06	9.5E+01	1.4E+02	5.8E+02	5.2E+05	1.1E+02
Antimony and compounds	7440-36-0	--	--	--	--	7.8E+00	--	--	7.8E+00
Antimony pentoxide	1314-60-9	--	--	--	--	9.8E+00	--	--	9.8E+00
Antimony potassium tartrate	28300-74-5	--	--	--	--	1.8E+01	--	--	1.8E+01
Antimony tetroxide	1332-81-6	--	--	--	--	7.8E+00	--	--	7.8E+00
Antimony trioxide	1309-64-4	--	--	--	--	--	--	1.0E+05	1.0E+05
Arsenic (inorganic) +++	7440-38-2	4.6E-01	--	1.3E+03	4.6E-01	5.9E+00	--	7.8E+03	5.9E+00
Arsine	7784-42-1	--	--	--	--	6.8E-02	--	2.6E+04	6.8E-02
Assure	76578-14-8	--	--	--	--	1.8E+02	7.4E+02	--	1.4E+02
Asulam	3337-71-1	--	--	--	--	7.0E+02	3.0E+03	--	5.7E+02
Atrazine	1912-24-9	3.0E+00	1.1E+01	--	2.4E+00	6.8E+02	2.9E+03	--	5.5E+02
Avermectin B1	65195-55-3	--	--	--	--	7.8E+00	3.3E+01	--	6.3E+00
Azobenzene	103-33-3	6.3E+00	--	4.7E+01	5.6E+00	--	--	--	--
Barium and compounds	7440-39-3	--	--	--	--	3.9E+03	--	2.6E+05	3.9E+03
Benfluralin (Benefin)	1861-40-1	--	--	--	--	9.8E+01	--	--	9.8E+01
Bensulfuron-methyl (Londax)	83055-99-6	--	--	--	--	3.9E+03	1.6E+04	--	3.2E+03
Bentazone (Bentazon)	25057-89-0	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
Benzaldehyde	100-52-7	1.7E+02	--	--	1.7E+02	2.0E+03	--	--	2.0E+03
Benzene	71-43-2	1.3E+01	--	1.3E+00	1.2E+00	7.8E+01	--	2.8E+01	2.0E+01
Benzidine	92-87-5	6.7E-04	2.6E-03	3.0E+01	5.3E-04	5.9E+01	2.5E+02	--	4.7E+01
Benzoic acid	65-85-0	--	--	--	--	7.8E+04	3.3E+05	--	6.3E+04
Benzotrichloride	98-07-7	5.3E-02	--	--	5.3E-02	--	--	--	--
Benzyl alcohol	100-51-6	--	--	--	--	2.0E+03	8.2E+03	--	1.6E+03
Benzyl chloride	100-44-7	4.1E+00	--	1.5E+00	1.1E+00	3.9E+01	--	6.6E+00	5.7E+00
Beryllium and compounds	7440-41-7	--	--	2.3E+03	2.3E+03	3.9E+01	--	1.0E+04	3.9E+01
Biphenthrin (Talstar)	82657-04-3	--	--	--	--	2.9E+02	1.2E+03	--	2.4E+02
1,1-Biphenyl	92-52-4	8.7E+01	--	--	8.7E+01	9.8E+03	--	1.2E+01	1.2E+01
Bis(2-chloroethyl)ether	111-44-4	6.3E-01	--	3.6E-01	2.3E-01	--	--	--	--
Bis(chloromethyl)ether	542-88-1	3.2E-03	--	8.5E-05	8.3E-05	--	--	--	--
Bis(2-chloro-1-methylethyl)ether	108-60-1	--	--	--	--	7.8E+02	--	--	7.8E+02
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	5.0E+01	1.8E+02	2.3E+06	3.9E+01	3.9E+02	1.6E+03	--	3.2E+02
Bisphenol A	80-05-7	--	--	--	--	9.8E+02	4.1E+03	--	7.9E+02
Boron	7440-42-8	--	--	--	--	3.9E+03	--	1.0E+07	3.9E+03
Boron trifluoride	7637-07-2	--	--	--	--	7.8E+02	--	6.8E+06	7.8E+02
Bromate	15541-45-4	9.9E-01	--	--	9.9E-01	7.8E+01	--	--	7.8E+01
Bromobenzene	108-86-1	--	--	--	--	1.6E+02	--	1.3E+02	7.1E+01
Bromodichloromethane	75-27-4	1.1E+01	--	3.0E-01	2.9E-01	3.9E+02	--	--	3.9E+02
Bromoform (Tribromomethane)	75-25-2	8.8E+01	--	2.5E+01	1.9E+01	3.9E+02	--	--	3.9E+02

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL SOIL							
		Cancer Risk = 1E-06				Chronic HQ = 0.25			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Bromomethane	74-83-9	--	--	--	--	2.7E+01	--	1.8E+00	1.7E+00
Bromophos	2104-96-3	--	--	--	--	9.8E+01	--	--	9.8E+01
Bromoxynil	1689-84-5	7.0E+00	2.5E+01	--	5.4E+00	2.9E+02	1.2E+03	--	2.4E+02
Bromoxynil octanoate	1689-99-2	7.0E+00	--	--	7.0E+00	2.9E+02	--	--	2.9E+02
1,3-Butadiene	106-99-0	2.0E-01	--	8.1E-02	5.8E-02	--	--	4.5E-01	4.5E-01
1-Butanol	71-36-3	--	--	--	--	2.0E+03	--	--	2.0E+03
Butylate	2008-41-5	--	--	--	--	9.8E+02	--	--	9.8E+02
Butyl benzyl phthalate	85-68-7	3.7E+02	1.3E+03	--	2.9E+02	3.9E+03	1.6E+04	--	3.2E+03
Butylphthalyl butylglycolate	85-70-1	--	--	--	--	2.0E+04	8.2E+04	--	1.6E+04
Cacodylic acid	75-60-5	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
Cadmium and compounds +++	7440-43-9	--	--	3.1E+03	3.1E+03	2.0E+01	2.1E+02	5.2E+03	1.8E+01
Camphechlor (Toxaphene)	8001-35-2	6.3E-01	2.2E+00	1.8E+04	4.9E-01	--	--	--	--
Caprolactam	105-60-2	--	--	--	--	9.8E+03	4.1E+04	1.1E+06	7.8E+03
Captafol	2425-06-1	4.6E+00	1.6E+01	1.3E+05	3.6E+00	3.9E+01	1.6E+02	--	3.2E+01
Captan	133-06-2	3.0E+02	1.1E+03	8.5E+06	2.4E+02	2.5E+03	1.1E+04	--	2.1E+03
Carbaryl	63-25-2	--	--	--	--	2.0E+03	8.2E+03	--	1.6E+03
Carbofuran	1563-66-2	--	--	--	--	9.8E+01	4.1E+02	--	7.9E+01
Carbon disulfide	75-15-0	--	--	--	--	2.0E+03	--	2.1E+02	1.9E+02
Carbon tetrachloride	56-23-5	9.9E+00	--	7.0E-01	6.5E-01	7.8E+01	--	3.9E+01	2.6E+01
Carbosulfan	55285-14-8	--	--	--	--	2.0E+02	8.2E+02	--	1.6E+02
Carboxin	5234-68-4	--	--	--	--	2.0E+03	8.2E+03	--	1.6E+03
Chloramben	133-90-4	--	--	--	--	2.9E+02	1.2E+03	--	2.4E+02
Chloranil	118-75-2	1.7E+00	6.2E+00	--	1.4E+00	--	--	--	--
Chlordane	12789-03-6	2.0E+00	1.8E+01	4.3E+01	1.7E+00	9.8E+00	1.0E+02	2.8E+02	8.7E+00
Chlordecone (Kepone)	143-50-0	7.0E-02	2.5E-01	1.2E+03	5.4E-02	5.9E+00	2.5E+01	--	4.7E+00
Chlorimuron-ethyl	90982-32-4	--	--	--	--	1.8E+03	7.4E+03	--	1.4E+03
Chlorine	7782-50-5	--	--	--	--	2.0E+03	--	4.8E-02	4.8E-02
Chlorine dioxide	10049-04-4	--	--	--	--	5.9E+02	--	1.0E+05	5.8E+02
Chloroacetic acid	79-11-8	--	--	--	--	--	--	--	--
2-Chloroacetophenone	532-27-4	--	--	--	--	--	--	1.6E+04	1.6E+04
4-Chloroaniline	106-47-8	3.5E+00	1.2E+01	--	2.7E+00	7.8E+01	3.3E+02	--	6.3E+01
Chlorobenzene	108-90-7	--	--	--	--	3.9E+02	--	8.4E+01	6.9E+01
Chlorobenzilate	510-15-6	6.3E+00	2.2E+01	1.8E+05	4.9E+00	3.9E+02	1.6E+03	--	3.2E+02
p-Chlorobenzoic acid	74-11-3	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
4-Chlorobenzotrifluoride	98-56-6	--	--	--	--	5.9E+01	--	5.3E+02	5.3E+01
2-Chloro-1,3-butadiene	126-99-8	--	--	1.0E-02	1.0E-02	3.9E+02	--	5.6E+00	5.5E+00
1-Chlorobutane	109-69-3	--	--	--	--	7.8E+02	--	--	7.8E+02
1-Chloro-1,1-difluoroethane	75-68-3	--	--	--	--	--	--	1.3E+04	1.3E+04
Chlorodifluoromethane	75-45-6	--	--	--	--	--	--	1.2E+04	1.2E+04
2-Chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester sulfurous acid (Aramite)	140-57-8	2.8E+01	9.9E+01	7.9E+05	2.2E+01	9.8E+02	4.1E+03	--	7.9E+02
Chloroform	67-66-3	2.2E+01	--	3.2E-01	3.2E-01	2.0E+02	--	6.7E+01	5.0E+01
Chloromethane	74-87-3	--	--	--	--	--	--	2.8E+01	2.8E+01
4-Chloro-2-methylaniline hydrochloride	3165-93-3	1.5E+00	5.4E+00	--	1.2E+00	--	--	--	--
beta-Chloronaphthalene	91-58-7	--	--	--	--	1.6E+03	5.1E+03	--	1.2E+03
o-Chloronitrobenzene	88-73-3	2.3E+00	8.2E+00	--	1.8E+00	5.9E+01	2.5E+02	5.2E+03	4.7E+01
p-Chloronitrobenzene	100-00-5	1.2E+01	4.1E+01	--	9.0E+00	1.4E+01	5.8E+01	1.0E+06	1.1E+01
2-Chlorophenol	95-57-8	--	--	--	--	9.8E+01	--	--	9.8E+01
Chlorothalonil	1897-45-6	2.2E+02	8.0E+02	6.3E+06	1.8E+02	2.9E+02	1.2E+03	--	2.4E+02
o-Chlorotoluene	95-49-8	--	--	--	--	3.9E+02	--	--	3.9E+02
Chlorpropham	101-21-3	--	--	--	--	9.8E+02	4.1E+03	--	7.9E+02
Chlorpyrifos	2921-88-2	--	--	--	--	2.0E+01	8.2E+01	--	1.6E+01
Chlorpyrifos-methyl	5598-13-0	--	--	--	--	2.0E+02	8.2E+02	--	1.6E+02
Chlorsulfuron	64902-72-3	--	--	--	--	9.8E+02	4.1E+03	--	7.9E+02
Chlorthiophos	60238-56-4	--	--	--	--	1.6E+01	6.6E+01	--	1.3E+01
Chromium, Total	7440-47-3	--	--	--	--	--	--	--	--
Chromium III *	16065-83-1	--	--	--	--	2.9E+04	--	--	2.9E+04
Chromium VI +++	18540-29-9	3.1E-01	--	2.4E+01	3.0E-01	5.9E+01	--	5.2E+04	5.9E+01
Clofentezine (Apollo)	74115-24-5	--	--	--	--	2.5E+02	1.1E+03	--	2.1E+02
Cobalt	7440-48-4	--	--	6.2E+02	6.2E+02	5.9E+00	--	3.1E+03	5.9E+00
Coke Oven Emissions	8007-45-2	--	--	3.3E+03	3.3E+03	--	--	--	--
Copper and compounds	7440-50-8	--	--	--	--	7.8E+02	--	--	7.8E+02

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL SOIL							
		Cancer Risk = 1E-06				Chronic HQ = 0.25			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Crotonaldehyde	123-73-9	3.7E-01	--	--	3.7E-01	2.0E+01	--	--	2.0E+01
Cumene (Isopropylbenzene)	98-82-8	--	--	--	--	2.0E+03	--	6.5E+02	4.9E+02
Cyanazine	21725-46-2	8.3E-01	2.9E+00	--	6.5E-01	3.9E+01	1.6E+02	--	3.2E+01
Cyanide (free)	57-12-5	--	--	--	--	1.2E+01	--	1.1E+01	5.7E+00
Cyanide (hydrogen)	74-90-8	--	--	--	--	1.2E+01	--	1.1E+01	5.6E+00
Cyanogen	460-19-5	--	--	--	--	2.0E+01	--	--	2.0E+01
Cyanogen bromide	506-68-3	--	--	--	--	1.8E+03	--	--	1.8E+03
Cyanogen chloride	506-77-4	--	--	--	--	9.8E+02	--	--	9.8E+02
Cyclohexane	110-82-7	--	--	--	--	--	--	1.6E+03	1.6E+03
Cyclohexanone	108-94-1	--	--	--	--	9.8E+04	--	7.6E+03	7.1E+03
Cyclohexylamine	108-91-8	--	--	--	--	3.9E+03	--	--	3.9E+03
Cyfluthrin (Baythroid)	68359-37-5	--	--	--	--	4.9E+02	2.1E+03	--	4.0E+02
Cyhalothrin (Karate)	68085-85-8	--	--	--	--	2.0E+01	8.2E+01	--	1.6E+01
Cyromazine	66215-27-8	--	--	--	--	9.8E+03	4.1E+04	--	7.9E+03
Dacthal	1861-32-1	--	--	--	--	2.0E+02	8.2E+02	--	1.6E+02
Dalapon	75-99-0	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
Daminozide (Alar)	1596-84-5	3.9E+01	1.4E+02	1.1E+06	3.0E+01	2.9E+03	1.2E+04	--	2.4E+03
Demeton	8065-48-3	--	--	--	--	7.8E-01	3.3E+00	--	6.3E-01
Diallate	2303-16-4	1.1E+01	4.1E+01	--	8.9E+00	--	--	--	--
Diazinon	333-41-5	--	--	--	--	1.4E+01	5.8E+01	--	1.1E+01
Dibenzofuran	132-64-9	--	--	--	--	2.0E+01	2.7E+02	--	1.8E+01
1,4-Dibromobenzene	106-37-6	--	--	--	--	2.0E+02	--	--	2.0E+02
Dibromochloromethane	124-48-1	8.3E+00	--	--	8.3E+00	3.9E+02	--	--	3.9E+02
1,2-Dibromo-3-chloropropane	96-12-8	1.9E-01	--	5.4E-03	5.3E-03	3.9E+00	--	1.7E+00	1.2E+00
1,2-Dibromoethane	106-93-4	3.5E-01	--	4.0E-02	3.6E-02	1.8E+02	--	2.0E+01	1.8E+01
Dibutyl phthalate	84-74-2	--	--	--	--	2.0E+03	8.2E+03	--	1.6E+03
Dicamba	1918-00-9	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
1,2-Dichlorobenzene	95-50-1	--	--	--	--	1.8E+03	--	6.1E+02	4.5E+02
1,4-Dichlorobenzene	106-46-7	1.3E+02	--	2.7E+00	2.6E+00	1.4E+03	--	2.2E+03	8.4E+02
3,3-Dichlorobenzidine	91-94-1	1.5E+00	5.5E+00	1.6E+04	1.2E+00	--	--	--	--
4,4'-Dichlorobenzophenone	90-98-2	--	--	--	--	1.8E+02	7.4E+02	--	1.4E+02
1,4-Dichloro-2-butene	764-41-0	--	--	2.1E-03	2.1E-03	--	--	--	--
Dichlorodifluoromethane	75-71-8	--	--	--	--	3.9E+03	--	2.2E+01	2.2E+01
p,p'-Dichlorodiphenyldichloroethane (DDD)	72-54-8	2.9E+00	1.0E+01	8.1E+04	2.3E+00	5.9E-01	2.5E+00	--	4.7E-01
p,p'-Dichlorodiphenyldichloroethylene (DDE)	72-55-9	2.0E+00	--	6.1E+01	2.0E+00	5.9E+00	--	--	5.9E+00
p,p'-Dichlorodiphenyltrichloroethane (DDT)	50-29-3	2.0E+00	2.4E+01	5.8E+04	1.9E+00	9.8E+00	1.4E+02	--	9.1E+00
1,1-Dichloroethane	75-34-3	1.2E+02	--	3.7E+00	3.6E+00	3.9E+03	--	--	3.9E+03
1,2-Dichloroethane	107-06-2	7.6E+00	--	4.9E-01	4.6E-01	1.2E+02	--	8.3E+00	7.8E+00
1,1-Dichloroethylene	75-35-4	--	--	--	--	9.8E+02	--	6.0E+01	5.7E+01
1,2-Dichloroethylene (cis)	156-59-2	--	--	--	--	3.9E+01	--	--	3.9E+01
1,2-Dichloroethylene (trans)	156-60-5	--	--	--	--	3.9E+02	--	--	3.9E+02
2,4-Dichlorophenol	120-83-2	--	--	--	--	5.9E+01	2.5E+02	--	4.7E+01
2,4-Dichlorophenoxy acetic acid (2,4-D)	94-75-7	--	--	--	--	2.0E+02	1.6E+03	--	1.7E+02
2,4-Dichlorophenoxy butyric acid (2,4-DB)	94-82-6	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
Decabromodiphenyl ether (BDE-209)	1163-19-5	9.9E+02	3.5E+03	--	7.8E+02	1.4E+02	5.8E+02	--	1.1E+02
1,2-Dichloropropane	78-87-5	1.9E+01	--	2.9E+00	2.5E+00	7.8E+02	--	3.9E+00	3.9E+00
2,3-Dichloropropanol	616-23-9	--	--	--	--	5.9E+01	2.5E+02	--	4.7E+01
1,3-Dichloropropene	542-75-6	7.0E+00	--	2.5E+00	1.8E+00	5.9E+02	--	1.9E+01	1.8E+01
Dichlorvos	62-73-7	2.4E+00	8.5E+00	6.8E+04	1.9E+00	9.8E+00	4.1E+01	2.6E+05	7.9E+00
Dicrotophos (Bidrin)	141-66-2	--	--	--	--	5.9E-01	2.5E+00	--	4.7E-01
Dicyclopentadiene	77-73-6	--	--	--	--	1.6E+03	--	3.2E-01	3.2E-01
Dieldrin	60-57-1	4.3E-02	1.5E-01	1.2E+03	3.4E-02	9.8E-01	4.1E+00	--	7.9E-01
Diethylene glycol, monobutyl ether	112-34-5	--	--	--	--	5.9E+02	2.5E+03	5.2E+04	4.7E+02
Diethylene glycol, monoethyl ether	111-90-0	--	--	--	--	1.2E+03	4.9E+03	1.6E+05	9.4E+02
Diethylformamide	617-84-5	--	--	--	--	2.0E+01	--	--	2.0E+01
Di(2-ethylhexyl)adipate	103-23-1	5.8E+02	2.1E+03	--	4.5E+02	1.2E+04	4.9E+04	--	9.5E+03
Diethyl phthalate	84-66-2	--	--	--	--	1.6E+04	6.6E+04	--	1.3E+04
Diethylstilbestrol	56-53-1	2.0E-03	7.1E-03	5.6E+01	1.6E-03	--	--	--	--
Difenzoquat (Avenge)	43222-48-6	--	--	--	--	1.6E+03	6.8E+03	--	1.3E+03
Diflubenzuron	35367-38-5	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
1,1-Difluoroethane	75-37-6	--	--	--	--	--	--	1.2E+04	1.2E+04

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL SOIL							
		Cancer Risk = 1E-06				Chronic HQ = 0.25			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Diisopropyl methylphosphonate (DIMP)	1445-75-6	--	--	--	--	1.6E+03	--	--	1.6E+03
Dimethipin	55290-64-7	--	--	--	--	4.3E+02	1.8E+03	--	3.5E+02
Dimethoate	60-51-5	--	--	--	--	4.3E+01	1.8E+02	--	3.5E+01
3,3'-Dimethoxybenzidine	119-90-4	4.3E-01	1.5E+00	--	3.4E-01	--	--	--	--
N-N-Dimethylaniline	121-69-7	2.6E+01	--	--	2.6E+01	3.9E+01	--	--	3.9E+01
2,4-Dimethylaniline	95-68-1	3.5E+00	1.2E+01	--	2.7E+00	3.9E+01	1.6E+02	--	3.2E+01
2,4-Dimethylaniline hydrochloride	21436-96-4	1.2E+00	4.3E+00	--	9.4E-01	--	--	--	--
3,3'-Dimethylbenzidine	119-93-7	6.3E-02	2.2E-01	--	4.9E-02	--	--	--	--
N,N-Dimethylformamide	68-12-2	--	--	--	--	2.0E+03	--	1.0E+03	6.6E+02
2,4-Dimethylphenol	105-67-9	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
2,6-Dimethylphenol	576-26-1	--	--	--	--	1.2E+01	4.9E+01	--	9.5E+00
3,4-Dimethylphenol	95-65-8	--	--	--	--	2.0E+01	8.2E+01	--	1.6E+01
Dimethyl terephthalate	120-61-6	--	--	--	--	2.0E+03	--	--	2.0E+03
4,6-Dinitro-o-cyclohexyl phenol	131-89-5	--	--	--	--	3.9E+01	1.6E+02	--	3.2E+01
1,2-Dinitrobenzene	528-29-0	--	--	--	--	2.0E+00	8.2E+00	--	1.6E+00
1,3-Dinitrobenzene	99-65-0	--	--	--	--	2.0E+00	8.2E+00	--	1.6E+00
1,4-Dinitrobenzene	100-25-4	--	--	--	--	2.0E+00	8.2E+00	--	1.6E+00
2,4-Dinitrophenol	51-28-5	--	--	--	--	3.9E+01	1.6E+02	--	3.2E+01
Dinitrotoluene mixture	25321-14-6	1.5E+00	5.5E+00	--	1.2E+00	1.8E+01	7.4E+01	--	1.4E+01
2,4-Dinitrotoluene	121-14-2	2.2E+00	7.8E+00	6.3E+04	1.7E+00	3.9E+01	1.6E+02	--	3.1E+01
2,6-Dinitrotoluene	606-20-2	4.6E-01	1.7E+00	--	3.6E-01	5.9E+00	2.5E+01	--	4.8E+00
Dinoseb	88-85-7	--	--	--	--	2.0E+01	8.2E+01	--	1.6E+01
1,4-Dioxane	123-91-1	7.0E+00	--	2.2E+01	5.3E+00	5.9E+02	--	3.1E+02	2.0E+02
Diphenamid	957-51-7	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
Diphenylamine	122-39-4	--	--	--	--	2.0E+03	8.2E+03	--	1.6E+03
N,N-Diphenyl-1,4 benzenediamine (DPPD)	74-31-7	--	--	--	--	5.9E+00	2.5E+01	--	4.7E+00
1,2-Diphenylhydrazine	122-66-7	8.7E-01	3.1E+00	2.5E+04	6.8E-01	--	--	--	--
Diphenyl sulfone	127-63-9	--	--	--	--	1.6E+01	6.6E+01	--	1.3E+01
Diquat dibromide (Diquat)	85-00-7	--	--	--	--	4.3E+01	1.8E+02	--	3.5E+01
Direct black 38	1937-37-7	9.8E-02	3.5E-01	4.0E+01	7.6E-02	--	--	--	--
Direct blue 6	2602-46-2	9.4E-02	3.3E-01	4.0E+01	7.3E-02	--	--	--	--
Direct brown 95	16071-86-6	1.0E-01	3.7E-01	4.0E+01	8.1E-02	--	--	--	--
Disulfoton	298-04-4	--	--	--	--	7.8E-01	3.3E+00	--	6.3E-01
1,4-Dithiane	505-29-3	--	--	--	--	2.0E+02	--	--	2.0E+02
Diuron	330-54-1	--	--	--	--	3.9E+01	1.6E+02	--	3.2E+01
Dodine	2439-10-3	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
Endosulfan	115-29-7	--	--	--	--	1.2E+02	--	--	1.2E+02
Endothall	145-73-3	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
Endrin	72-20-8	--	--	--	--	5.9E+00	2.5E+01	--	4.7E+00
Enilconazole (Imazalil)	35554-44-0	1.1E+01	4.1E+01	--	8.9E+00	4.9E+01	2.1E+02	--	4.0E+01
Epichlorohydrin	106-89-8	7.0E+01	--	4.4E+01	2.7E+01	1.2E+02	--	4.9E+00	4.7E+00
1,2-Epoxybutane	106-88-7	--	--	--	--	--	--	4.0E+01	4.0E+01
S-Ethyl dipropylthiocarbamate (EPTC)	759-94-4	--	--	--	--	9.8E+02	--	--	9.8E+02
2-Chloroethyl phosphonic acid (Ethephon)	16672-87-0	--	--	--	--	9.8E+01	4.1E+02	--	7.9E+01
Ethion	563-12-2	--	--	--	--	9.8E+00	4.1E+01	--	7.9E+00
2-Ethoxyethanol	110-80-5	--	--	--	--	1.8E+03	--	5.1E+03	1.3E+03
2-Ethoxyethanol acetate	111-15-9	--	--	--	--	2.0E+03	--	9.6E+02	6.4E+02
Ethyl acetate	141-78-6	--	--	--	--	1.8E+04	--	1.6E+02	1.6E+02
Ethyl acrylate	140-88-5	--	--	--	--	9.8E+01	--	1.3E+01	1.2E+01
Ethylbenzene	100-41-4	6.3E+01	--	6.4E+00	5.8E+00	2.0E+03	--	1.5E+03	8.4E+02
Ethyl chloride (Chloroethane)	75-00-3	--	--	--	--	--	--	3.4E+03	3.4E+03
Ethylene cyanohydrin	109-78-4	--	--	--	--	1.4E+03	5.8E+03	--	1.1E+03
Ethylene diamine	107-15-3	--	--	--	--	1.8E+03	--	--	1.8E+03
Ethylene glycol	107-21-1	--	--	--	--	3.9E+04	1.6E+05	2.1E+08	3.2E+04
Ethylene glycol, monobutyl ether	111-76-2	--	--	--	--	2.0E+03	8.2E+03	8.3E+08	1.6E+03
Ethylene oxide	75-21-8	4.9E-01	--	2.1E-03	2.0E-03	--	--	4.8E+01	4.8E+01
Ethylene thiourea (ETU)	96-45-7	1.5E+01	5.5E+01	4.3E+05	1.2E+01	1.6E+00	6.6E+00	--	1.3E+00
Ethyl ether	60-29-7	--	--	--	--	3.9E+03	--	--	3.9E+03
Ethyl methacrylate	97-63-2	--	--	--	--	--	--	4.5E+02	4.5E+02
Ethyl p-nitrophenyl phenylphosphorothioate (EPN)	2104-64-5	--	--	--	--	2.0E-01	8.2E-01	--	1.6E-01
Ethylphthalyl ethyl glycolate	84-72-0	--	--	--	--	5.9E+04	2.5E+05	--	4.7E+04

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CONTAMINANT	CAS No.	RESIDENTIAL SOIL							
		Cancer Risk = 1E-06				Chronic HQ = 0.25			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Fenamiphos	22224-92-6	--	--	--	--	4.9E+00	2.1E+01	--	4.0E+00
Fenpropathrin (Danitol)	39515-41-8	--	--	--	--	4.9E+02	2.1E+03	--	4.0E+02
Fenvalerate (Pydrin)	51630-58-1	--	--	--	--	4.9E+02	2.1E+03	--	4.0E+02
Fluometuron	2164-17-2	--	--	--	--	2.5E+02	1.1E+03	--	2.1E+02
Fluoride	16984-48-8	--	--	--	--	7.8E+02	--	6.8E+06	7.8E+02
Fluoridone	59756-60-4	--	--	--	--	1.6E+03	6.6E+03	--	1.3E+03
Flurprimidol	56425-91-3	--	--	--	--	7.8E+02	3.3E+03	--	6.3E+02
Flusilazole (NuStar)	85509-19-9	--	--	--	--	3.9E+01	--	--	3.9E+01
Flutolanil	66332-96-5	--	--	--	--	9.8E+03	4.1E+04	--	7.9E+03
Fluvalinate	69409-94-5	--	--	--	--	2.0E+02	8.2E+02	--	1.6E+02
Folpet	133-07-3	--	--	--	--	1.8E+03	7.4E+03	--	1.4E+03
Fomesafen	72178-02-0	--	--	--	--	4.9E+01	2.1E+02	--	4.0E+01
Fonofos	944-22-9	--	--	--	--	3.9E+01	1.6E+02	--	3.2E+01
Formaldehyde	50-00-0	--	--	1.7E+01	1.7E+01	3.9E+03	--	2.0E+02	1.9E+02
Formic acid	64-18-6	--	--	--	--	1.8E+04	--	7.3E+00	7.3E+00
Fosetyl-al	39148-24-8	--	--	--	--	4.9E+04	2.1E+05	--	4.0E+04
Furan	110-00-9	--	--	--	--	2.0E+01	2.7E+02	--	1.8E+01
Furazolidone	67-45-8	1.8E-01	6.5E-01	--	1.4E-01	--	--	--	--
Furfural	98-01-1	--	--	--	--	5.9E+01	--	6.3E+02	5.4E+01
Furmecyclox	60568-05-0	2.3E+01	8.2E+01	6.5E+05	1.8E+01	--	--	--	--
Furothiazole (Furium)	531-82-8	4.6E-01	1.6E+00	1.3E+04	3.6E-01	--	--	--	--
Glufosinate-ammonium	77182-82-2	--	--	--	--	1.2E+02	4.9E+02	--	9.5E+01
Glycidaldehyde	765-34-4	--	--	--	--	7.8E+00	--	2.2E+01	5.8E+00
Glyphosate	1071-83-6	--	--	--	--	2.0E+03	8.2E+03	--	1.6E+03
Haloxyfop-methyl	69806-40-2	--	--	--	--	9.8E-01	4.1E+00	--	7.9E-01
Thifensulfuron-methyl (Harmony)	79277-27-3	--	--	--	--	8.4E+02	3.5E+03	--	6.8E+02
Heptachlor	76-44-8	1.5E-01	--	1.0E+00	1.3E-01	9.8E+00	--	--	9.8E+00
Heptachlor epoxide	1024-57-3	7.6E-02	--	9.1E-01	7.0E-02	2.5E-01	--	--	2.5E-01
Hexabromobenzene	87-82-1	--	--	--	--	3.9E+01	--	--	3.9E+01
Hexachlorobenzene	118-74-1	4.3E-01	--	4.1E-01	2.1E-01	1.6E+01	--	--	1.6E+01
Hexachlorobutadiene	87-68-3	8.9E+00	--	1.4E+00	1.2E+00	2.0E+01	--	--	2.0E+01
alpha-Hexachlorocyclohexane (alpha-HCH)	319-84-6	1.1E-01	3.9E-01	3.1E+03	8.6E-02	1.6E+02	6.6E+02	--	1.3E+02
beta-Hexachlorocyclohexane (beta-HCH)	319-85-7	3.9E-01	1.4E+00	1.1E+04	3.0E-01	--	--	--	--
gamma-Hexachlorocyclohexane (Lindane)	58-89-9	6.3E-01	5.6E+00	1.8E+04	5.7E-01	5.9E+00	6.2E+01	--	5.4E+00
Hexachlorocyclohexane technical	608-73-1	3.9E-01	1.4E+00	1.1E+04	3.0E-01	--	--	--	--
Hexachlorocyclopentadiene	77-47-4	--	--	--	--	1.2E+02	--	4.4E-01	4.4E-01
Hexachloroethane	67-72-1	1.7E+01	--	2.0E+00	1.8E+00	1.4E+01	--	6.3E+01	1.1E+01
Hexachlorophene	70-30-4	--	--	--	--	5.9E+00	2.5E+01	--	4.7E+00
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX/Cyclonite)	121-82-4	6.3E+00	1.5E+02	--	6.1E+00	5.9E+01	1.6E+03	--	5.7E+01
1,6-Hexamethylene diisocyanate	822-06-0	--	--	--	--	--	--	7.8E-01	7.8E-01
n-Hexane	110-54-3	--	--	--	--	--	--	1.5E+02	1.5E+02
Hexazinone	51235-04-2	--	--	--	--	6.5E+02	2.7E+03	--	5.2E+02
Hexythiazox (Savey)	78587-05-0	--	--	--	--	4.9E+02	2.1E+03	--	4.0E+02
Hydramethylnon (Amdro)	67485-29-4	--	--	--	--	3.3E+02	1.4E+03	--	2.7E+02
Hydrazine, hydrazine sulfate	302-01-2	2.3E-01	--	1.1E+03	2.3E-01	--	--	1.6E+04	1.6E+04
Hydrazine, dimethyl	57-14-7	--	--	--	--	2.0E+00	--	1.4E-02	1.4E-02
Hydrogen chloride	7647-01-0	--	--	--	--	--	--	1.0E+07	1.0E+07
Hydrogen sulfide	7783-06-4	--	--	--	--	--	--	1.0E+06	1.0E+06
p-Hydroquinone	123-31-9	1.2E+01	4.1E+01	--	9.0E+00	7.8E+02	3.3E+03	--	6.3E+02
Imazaquin	81335-37-7	--	--	--	--	4.9E+03	2.1E+04	--	4.0E+03
Imazethapyr (Pursuit)	81335-77-5	--	--	--	--	4.9E+04	2.1E+05	--	4.0E+04
Iprodione	36734-19-7	--	--	--	--	7.8E+02	3.3E+03	--	6.3E+02
Iron	7439-89-6	--	--	--	--	1.4E+04	--	--	1.4E+04
Isobutanol (Isobutyl alcohol)	78-83-1	--	--	--	--	5.9E+03	--	--	5.9E+03
Isophorone	78-59-1	7.3E+02	2.6E+03	--	5.7E+02	3.9E+03	1.6E+04	1.0E+09	3.2E+03
Isopropalin	33820-53-0	--	--	--	--	2.9E+02	--	--	2.9E+02
Isopropyl methyl phosphonic acid	1832-54-8	--	--	--	--	2.0E+03	8.2E+03	--	1.6E+03
Isoxaben	82558-50-7	--	--	--	--	9.8E+02	4.1E+03	--	7.9E+02
Lactofen	77501-63-4	--	--	--	--	1.6E+02	6.6E+02	--	1.3E+02
Lead +++	7439-92-1	--	--	--	--	--	--	--	--
Lead (tetraethyl)	78-00-2	--	--	--	--	2.0E-03	--	--	2.0E-03

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL SOIL							
		Cancer Risk = 1E-06				Chronic HQ = 0.25			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Linuron	330-55-2	--	--	--	--	1.5E+02	6.3E+02	--	1.2E+02
Lithium	7439-93-2	--	--	--	--	3.9E+01	--	--	3.9E+01
Malathion	121-75-5	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
Maleic anhydride	108-31-6	--	--	--	--	2.0E+03	8.2E+03	3.6E+05	1.6E+03
Maleic hydrazide	123-33-1	--	--	--	--	9.8E+03	4.1E+04	--	7.9E+03
Malononitrile	109-77-3	--	--	--	--	2.0E+00	8.2E+00	--	1.6E+00
Mancozeb	8018-01-7	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
Maneb	12427-38-2	--	--	--	--	9.8E+01	4.1E+02	--	7.9E+01
Manganese (non-food) +++	7439-96-5	--	--	--	--	2.7E+03	--	2.6E+04	2.5E+03
Mephosfolan	950-10-7	--	--	--	--	1.8E+00	7.4E+00	--	1.4E+00
Mepiquat chloride (Mepiquat)	24307-26-4	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
Mercury and compounds	7487-94-7	--	--	--	--	5.9E+00	--	1.6E+05	5.9E+00
Mercury (elemental)	7439-97-6	--	--	--	--	--	--	2.7E+00	2.7E+00
Mercury (methyl)	22967-92-6	--	--	--	--	2.0E+00	--	--	2.0E+00
Merphos	150-50-5	--	--	--	--	5.9E-01	--	--	5.9E-01
Merphos oxide	78-48-8	--	--	--	--	2.0E+00	8.2E+00	--	1.6E+00
Metalaxyl	57837-19-1	--	--	--	--	1.2E+03	4.9E+03	--	9.5E+02
Methacrylonitrile	126-98-7	--	--	--	--	2.0E+00	--	5.3E+01	1.9E+00
Methamidophos	10265-92-6	--	--	--	--	9.8E-01	4.1E+00	--	7.9E-01
Methanol	67-56-1	--	--	--	--	3.9E+04	--	1.5E+05	3.1E+04
Methidathion	950-37-8	--	--	--	--	2.9E+01	1.2E+02	--	2.4E+01
Methomyl	16752-77-5	--	--	--	--	4.9E+02	2.1E+03	--	4.0E+02
Methoxychlor	72-43-5	--	--	--	--	9.8E+01	4.1E+02	--	7.9E+01
2-Methoxyethanol	109-86-4	--	--	--	--	9.8E+01	--	5.3E+02	8.2E+01
2-Methoxyethanol acetate	110-49-6	--	--	--	--	1.6E+02	--	3.2E+01	2.7E+01
2-Methoxy-5-nitroaniline	99-59-2	1.4E+01	5.0E+01	4.0E+05	1.1E+01	--	--	--	--
Methyl acetate	79-20-9	--	--	--	--	2.0E+04	--	--	2.0E+04
Methyl acrylate	96-33-3	--	--	--	--	--	--	3.6E+01	3.6E+01
2-Methylaniline hydrochloride	636-21-5	5.3E+00	1.9E+01	1.5E+05	4.2E+00	--	--	--	--
Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	17804-35-2	--	--	--	--	9.8E+02	4.1E+03	--	7.9E+02
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	94-74-6	--	--	--	--	9.8E+00	4.1E+01	--	7.9E+00
4-(2-Methyl-4-chlorophenoxy) butyric acid (MCPB)	94-81-5	--	--	--	--	8.6E+01	3.6E+02	--	7.0E+01
2-(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)	93-65-2	--	--	--	--	2.0E+01	8.2E+01	--	1.6E+01
4,4'-Methylenebisbenzeneamine	101-77-9	4.3E-01	1.5E+00	1.2E+04	3.4E-01	--	--	1.0E+07	1.0E+07
4,4'-Methylene bis(2-chloroaniline)	101-14-4	1.5E+00	6.0E+00	4.7E+03	1.2E+00	3.9E+01	1.6E+02	--	3.2E+01
4,4'-Methylene bis(N,N'-dimethyl)aniline	101-61-1	1.5E+01	5.4E+01	4.3E+05	1.2E+01	--	--	--	--
Methylene bromide	74-95-3	--	--	--	--	--	--	5.9E+00	5.9E+00
Methylene chloride	75-09-2	7.7E+01	--	2.2E+02	5.7E+01	1.2E+02	--	3.4E+02	8.7E+01
4,4'-Methylenediphenyl isocyanate	101-68-8	--	--	--	--	--	--	3.1E+05	3.1E+05
2-(1-Methylethoxy)phenol methylcarbamate (Baygon)	114-26-1	--	--	--	--	7.8E+01	3.3E+02	--	6.3E+01
Methyl ethyl ketone (2-Butanone)	78-93-3	--	--	--	--	1.2E+04	--	1.6E+04	6.8E+03
Methyl isobutyl ketone (4-Methyl-2-pentanone)	108-10-1	--	--	--	--	--	--	8.3E+03	8.3E+03
Methyl methacrylate	80-62-6	--	--	--	--	2.7E+04	--	1.2E+03	1.1E+03
2-Methyl-5-nitroaniline	99-55-8	7.7E+01	2.7E+02	--	6.0E+01	3.9E+02	1.6E+03	--	3.2E+02
Methyl parathion	298-00-0	--	--	--	--	4.9E+00	2.1E+01	--	4.0E+00
2-Methylphenol	95-48-7	--	--	--	--	9.8E+02	4.1E+03	3.1E+08	7.9E+02
3-Methylphenol	108-39-4	--	--	--	--	9.8E+02	4.1E+03	3.1E+08	7.9E+02
4-Methylphenol	106-44-5	--	--	--	--	2.0E+03	8.2E+03	3.1E+08	1.6E+03
Methyl phosphonic acid	993-13-5	--	--	--	--	1.2E+03	4.9E+03	--	9.5E+02
Methyl styrene (mixture)	25013-15-4	--	--	--	--	1.2E+02	--	2.5E+02	8.0E+01
Methyl styrene (alpha)	98-83-9	--	--	--	--	1.4E+03	--	--	1.4E+03
Methyl tertbutyl ether (MTBE)	1634-04-4	3.9E+02	--	5.3E+01	4.7E+01	--	--	3.8E+03	3.8E+03
Metolaclor (Dual)	51218-45-2	--	--	--	--	2.9E+03	1.2E+04	--	2.4E+03
Metribuzin	21087-64-9	--	--	--	--	4.9E+02	2.1E+03	--	4.0E+02
Metsulfuron-methyl (Ally)	74223-64-6	--	--	--	--	4.9E+03	2.1E+04	--	4.0E+03
Mirex	2385-85-5	3.9E-02	--	4.7E-01	3.6E-02	3.9E+00	--	--	3.9E+00
Molinate	2212-67-1	--	--	--	--	3.9E+01	1.6E+02	--	3.2E+01
Molybdenum	7439-98-7	--	--	--	--	9.8E+01	--	--	9.8E+01
Monochloramine	10599-90-3	--	--	--	--	2.0E+03	--	--	2.0E+03
Myclobutanil (Systhane)	88671-89-0	--	--	--	--	4.9E+02	2.1E+03	--	4.0E+02
Naled	300-76-5	--	--	--	--	3.9E+01	--	--	3.9E+01

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		Cancer Risk = 1E-06				Chronic HQ = 0.25			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Napropamide	15299-99-7	--	--	--	--	2.3E+03	9.9E+03	--	1.9E+03
Nickel and compounds	7440-02-0	--	--	2.2E+04	2.2E+04	3.9E+02	--	4.7E+04	3.9E+02
Nickel refinery dust	7440-02-0-NRD	--	--	2.3E+04	2.3E+04	2.2E+02	--	7.3E+03	2.1E+02
Nickel subsulfide	12035-72-2	4.1E-01	--	1.2E+04	4.1E-01	2.2E+02	--	7.3E+03	2.1E+02
Nitrate	14797-55-8	--	--	--	--	3.1E+04	--	--	3.1E+04
Nitrite	14797-65-0	--	--	--	--	2.0E+03	--	--	2.0E+03
2-Nitroaniline	88-74-4	--	--	--	--	2.0E+02	8.2E+02	2.6E+04	1.6E+02
Nitrobenzene	98-95-3	--	--	5.1E+00	5.1E+00	3.9E+01	--	1.7E+02	3.2E+01
Nitrofurantoin	67-20-9	--	--	--	--	1.4E+03	5.8E+03	--	1.1E+03
Nitrofurazone	59-87-0	5.3E-01	1.9E+00	1.5E+04	4.2E-01	--	--	--	--
Nitroglycerin	55-63-0	4.1E+01	1.5E+02	--	3.2E+01	2.0E+00	8.2E+00	--	1.6E+00
Nitroguanidine	556-88-7	--	--	--	--	2.0E+03	8.2E+03	--	1.6E+03
2-Nitropropane	79-46-9	--	--	1.4E-02	1.4E-02	--	--	6.8E+01	6.8E+01
N-Nitrosodi-n-butylamine	924-16-3	1.3E-01	--	4.3E-01	9.9E-02	--	--	--	--
N-Nitrosodiethanolamine	1116-54-7	2.5E-01	8.8E-01	7.0E+03	1.9E-01	--	--	--	--
N-Nitrosodiethylamine	55-18-5	1.0E-03	4.0E-03	4.7E+01	8.1E-04	--	--	--	--
N-Nitrosodimethylamine	62-75-9	3.0E-03	--	6.0E-03	2.0E-03	1.6E-01	--	8.6E-01	1.3E-01
N-Nitrosodiphenylamine	86-30-6	1.4E+02	5.0E+02	2.2E+06	1.1E+02	--	--	--	--
N-Nitroso di-n-propylamine	621-64-7	9.9E-02	3.5E-01	2.8E+03	7.8E-02	--	--	--	--
N-Nitroso-N-methylethylamine	10595-95-6	3.2E-02	--	5.4E-02	2.0E-02	--	--	--	--
N-Nitrosopyrrolidine	930-55-2	3.3E-01	1.2E+00	9.2E+03	2.6E-01	--	--	--	--
m-Nitrotoluene	99-08-1	--	--	--	--	2.0E+00	8.2E+00	--	1.6E+00
o-Nitrotoluene	88-72-2	3.2E+00	--	--	3.2E+00	1.8E+01	--	--	1.8E+01
p-Nitrotoluene	99-99-0	4.3E+01	1.5E+02	--	3.4E+01	7.8E+01	3.3E+02	--	6.3E+01
Norflurazon	27314-13-2	--	--	--	--	2.9E+02	1.2E+03	--	2.4E+02
Octabromodiphenyl ether	32536-52-0	--	--	--	--	5.9E+01	2.5E+02	--	4.7E+01
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	--	--	--	--	9.8E+02	6.9E+04	--	9.6E+02
Octamethylpyrophosphoramide	152-16-9	--	--	--	--	3.9E+01	1.6E+02	--	3.2E+01
Oryzalin	19044-88-3	8.9E+01	3.2E+02	--	7.0E+01	2.7E+03	1.2E+04	--	2.2E+03
Oxadiazon	19666-30-9	--	--	--	--	9.8E+01	4.1E+02	--	7.9E+01
Oxamyl	23135-22-0	--	--	--	--	4.9E+02	2.1E+03	--	4.0E+02
Oxyfluorfen	42874-03-3	9.5E+00	3.4E+01	--	7.4E+00	5.9E+02	2.5E+03	--	4.7E+02
Paclobutrazol	76738-62-0	--	--	--	--	2.5E+02	1.1E+03	--	2.1E+02
Paraquat	4685-14-7	--	--	--	--	8.8E+01	3.7E+02	--	7.1E+01
Parathion	56-38-2	--	--	--	--	1.2E+02	4.9E+02	--	9.5E+01
Pebulate	1114-71-2	--	--	--	--	9.8E+02	--	--	9.8E+02
Pendimethalin	40487-42-1	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
Pentabromo-6-chloro cyclohexane	87-84-3	3.5E+01	1.2E+02	--	2.7E+01	3.9E+02	1.6E+03	--	3.2E+02
Pentabromodiphenyl ether	32534-81-9	--	--	--	--	3.9E+01	--	--	3.9E+01
Pentachlorobenzene	608-93-5	--	--	--	--	1.6E+01	--	--	1.6E+01
Pentachloronitrobenzene	82-68-8	2.7E+00	--	--	2.7E+00	5.9E+01	--	--	5.9E+01
Pentachlorophenol	87-86-5	1.7E+00	2.5E+00	1.1E+06	1.0E+00	9.8E+01	1.6E+02	--	6.1E+01
Perchlorate	14797-73-0	--	--	--	--	1.4E+01	--	--	1.4E+01
Perfluoroalkyl Compounds	**0.0E+00**								
Perfluoro-octanesulfonate (PFOS)^^	1763-23-1	--	--	--	--	3.9E+00	1.6E+01	--	3.2E+00
Perfluorooctanoic acid (PFOA)^^	335-67-1	9.9E+00	3.5E+01	--	7.8E+00	3.9E-01	1.6E+00	--	3.2E-01
Permethrin	52645-53-1	--	--	--	--	9.8E+02	4.1E+03	--	7.9E+02
Phenmedipham	13684-63-4	--	--	--	--	4.7E+03	2.0E+04	--	3.8E+03
Phenol	108-95-2	--	--	--	--	5.9E+03	2.5E+04	1.0E+08	4.7E+03
m-Phenylenediamine	108-45-2	--	--	--	--	1.2E+02	4.9E+02	--	9.5E+01
p-Phenylenediamine	106-50-3	--	--	--	--	2.0E+01	8.2E+01	--	1.6E+01
Phenylmercuric acetate	62-38-4	--	--	--	--	1.6E+00	6.6E+00	--	1.3E+00
2-Phenylphenol	90-43-7	3.7E+02	1.3E+03	--	2.9E+02	--	--	--	--
Phorate	298-02-2	--	--	--	--	3.9E+00	1.6E+01	--	3.2E+00
Phosmet	732-11-6	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
Phosphine	7803-51-2	--	--	--	--	5.9E+00	--	1.6E+05	5.9E+00
Phosphoric acid	7664-38-2	--	--	--	--	9.6E+05	--	5.2E+06	8.1E+05
Phosphorus (white)	7723-14-0	--	--	--	--	3.9E-01	--	--	3.9E-01
p-Phthalic acid	100-21-0	--	--	--	--	2.0E+04	8.2E+04	--	1.6E+04
Phthalic anhydride	85-44-9	--	--	--	--	3.9E+04	1.6E+05	1.0E+07	3.2E+04
Picloram	1918-02-1	--	--	--	--	1.4E+03	5.8E+03	--	1.1E+03

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL SOIL							
		Cancer Risk = 1E-06				Chronic HQ = 0.25			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Pirimiphos-methyl	29232-93-7	--	--	--	--	1.4E+00	5.8E+00	--	1.1E+00
Polybrominated biphenyls (PBBs)	59536-65-1	2.3E-02	8.2E-02	6.5E+02	1.8E-02	1.4E-01	5.8E-01	--	1.1E-01
Polychlorinated biphenyls (PCBs)	1336-36-3	3.5E-01	8.8E-01	2.6E+00	2.3E-01	--	--	--	--
Aroclor 1016	12674-11-2	9.9E+00	--	2.8E+05	9.9E+00	1.4E+00	--	--	1.4E+00
Aroclor 1221	11104-28-2	3.5E-01	8.8E-01	1.0E+00	2.0E-01	--	--	--	--
Aroclor 1232	11141-16-5	3.5E-01	8.8E-01	5.5E-01	1.7E-01	--	--	--	--
Aroclor 1242	53469-21-9	3.5E-01	8.8E-01	2.9E+00	2.3E-01	--	--	--	--
Aroclor 1248	12672-29-6	3.5E-01	8.8E-01	3.1E+00	2.3E-01	--	--	--	--
Aroclor 1254	11097-69-1	3.5E-01	8.8E-01	4.1E+00	2.4E-01	3.9E-01	1.2E+00	--	2.9E-01
Aroclor 1260	11096-82-5	3.5E-01	8.8E-01	6.5E+00	2.4E-01	--	--	--	--
Polynuclear aromatic hydrocarbons (PAHs)	0.0E+00								
Acenaphthene	83-32-9	--	--	--	--	1.2E+03	3.8E+03	--	9.0E+02
Anthracene									
Benz[a]anthracene	56-55-3	1.5E+00	4.6E+00	7.4E+01	1.1E+00	--	--	--	--
Benzo[a]pyrene	50-32-8	1.5E-01	4.6E-01	3.4E+03	1.1E-01	5.9E+00	1.9E+01	1.0E+03	4.5E+00
Benzo[b]fluoranthene	205-99-2								
Benzo[k]fluoranthene	207-08-9	1.5E+01	4.6E+01	3.4E+05	1.1E+01	--	--	--	--
Chrysene	218-01-9	1.5E+02	4.6E+02	3.4E+06	1.1E+02	--	--	--	--
Dibenz[ah]anthracene	53-70-3	1.5E-01	4.6E-01	3.4E+03	1.1E-01	--	--	--	--
Fluoranthene	206-44-0	--	--	--	--	7.8E+02	2.5E+03	--	6.0E+02
Fluorene	86-73-7	--	--	--	--	7.8E+02	2.5E+03	--	6.0E+02
Indeno[1,2,3-cd]pyrene	193-39-5	1.5E+00	4.6E+00	3.4E+04	1.1E+00	--	--	--	--
Naphthalene	91-20-3	--	--	3.8E+00	3.8E+00	3.9E+02	1.3E+03	3.6E+01	3.2E+01
Pyrene	129-00-0								
Prochloraz	67747-09-5	4.6E+00	1.6E+01	--	3.6E+00	1.8E+02	7.4E+02	--	1.4E+02
Profluralin	26399-36-0	--	--	--	--	1.2E+02	--	--	1.2E+02
Prometon	1610-18-0	--	--	--	--	2.9E+02	1.2E+03	--	2.4E+02
Prometryn	7287-19-6	--	--	--	--	7.8E+02	3.3E+03	--	6.3E+02
Propyzamide (Pronamide)	23950-58-5	--	--	--	--	1.5E+03	6.2E+03	--	1.2E+03
Propachlor	1918-16-7	--	--	--	--	2.5E+02	1.1E+03	--	2.1E+02
Propanil	709-98-8	--	--	--	--	9.8E+01	4.1E+02	--	7.9E+01
Propargite	2312-35-8	3.7E+00	1.3E+01	--	2.9E+00	7.8E+02	3.3E+03	--	6.3E+02
Propargyl alcohol	107-19-7	--	--	--	--	3.9E+01	--	--	3.9E+01
Propazine	139-40-2	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
Propham	122-42-9	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
Propiconazole	60207-90-1	--	--	--	--	2.0E+03	8.2E+03	--	1.6E+03
n-Propylbenzene	103-65-1	--	--	--	--	2.0E+03	--	1.8E+03	9.4E+02
Propylene glycol	57-55-6	--	--	--	--	3.9E+05	1.6E+06	--	3.2E+05
Propylene glycol, monoethyl ether	52125-53-8	--	--	--	--	1.4E+04	--	4.1E+04	1.0E+04
Propylene glycol, monomethyl ether	107-98-2	--	--	--	--	1.4E+04	--	4.1E+04	1.0E+04
Propylene oxide	75-56-9	2.9E+00	--	5.9E+01	2.8E+00	--	--	6.1E+02	6.1E+02
Pyridine	110-86-1	--	--	--	--	2.0E+01	--	--	2.0E+01
Quinalphos	13593-03-8	--	--	--	--	9.8E+00	4.1E+01	--	7.9E+00
Quinoline	91-22-5	2.3E-01	8.2E-01	--	1.8E-01	--	--	--	--
Resmethrin	10453-86-8	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
Ronnel	299-84-3	--	--	--	--	9.8E+02	--	--	9.8E+02
Rotenone	83-79-4	--	--	--	--	7.8E+01	3.3E+02	--	6.3E+01
Selenious Acid	7783-00-8	--	--	--	--	9.8E+01	--	--	9.8E+01
Selenium	7782-49-2	--	--	--	--	9.8E+01	--	1.0E+07	9.8E+01
Sethoxydim	74051-80-2	--	--	--	--	2.7E+03	1.2E+04	--	2.2E+03
Silver and compounds	7440-22-4	--	--	--	--	9.8E+01	--	--	9.8E+01
Simazine	122-34-9	5.8E+00	2.1E+01	--	4.5E+00	9.8E+01	4.1E+02	--	7.9E+01
Sodium azide	26628-22-8	--	--	--	--	7.8E+01	--	--	7.8E+01
Sodium diethyldithiocarbamate	148-18-5	2.6E+00	9.2E+00	--	2.0E+00	5.9E+02	2.5E+03	--	4.7E+02
Sodium fluoroacetate	62-74-8	--	--	--	--	3.9E-01	1.6E+00	--	3.2E-01
Sodium metavanadate	13718-26-8	--	--	--	--	2.0E+01	--	--	2.0E+01
Strontium, stable	7440-24-6	--	--	--	--	1.2E+04	--	--	1.2E+04
Strychnine	57-24-9	--	--	--	--	5.9E+00	2.5E+01	--	4.7E+00
Styrene	100-42-5	--	--	--	--	3.9E+03	--	2.4E+03	1.5E+03
1,1'-Sulfonylbis (4-Chlorobenzene)	80-07-9	--	--	--	--	1.6E+01	6.6E+01	--	1.3E+01
Tebuthiuron	34014-18-1	--	--	--	--	1.4E+03	5.8E+03	--	1.1E+03

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL SOIL							
		Cancer Risk = 1E-06				Chronic HQ = 0.25			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Temephos	3383-96-8	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
Terbacil	5902-51-2	--	--	--	--	2.5E+02	1.1E+03	--	2.1E+02
Terbufos	13071-79-9	--	--	--	--	4.9E-01	--	--	4.9E-01
Terbutryn	886-50-0	--	--	--	--	2.0E+01	8.2E+01	--	1.6E+01
1,2,4,5-Tetrachlorobenzene	95-94-3	--	--	--	--	5.9E+00	--	--	5.9E+00
2,3,7,8-Tetrachlorodibenzo-p-dioxin (Dioxin)	1746-01-6	5.3E-06	6.3E-05	1.4E-04	4.8E-06	1.4E-05	1.9E-04	2.0E-02	1.3E-05
1,1,1,2-Tetrachloroethane	630-20-6	2.7E+01	--	2.2E+00	2.0E+00	5.9E+02	--	--	5.9E+02
1,1,2,2-Tetrachloroethane	79-34-5	3.5E+00	--	7.3E-01	6.0E-01	3.9E+02	--	--	3.9E+02
Tetrachloroethylene (PCE)	127-18-4	3.3E+02	--	2.5E+01	2.4E+01	1.2E+02	--	2.4E+01	2.0E+01
2,3,4,6-Tetrachlorophenol	58-90-2	--	--	--	--	5.9E+02	2.5E+03	--	4.7E+02
p,a,a,a-Tetrachlorotoluene	5216-25-1	3.5E-02	--	--	3.5E-02	--	--	--	--
Tetrachlorovinphos (Stirofos)	961-11-5	2.9E+01	1.0E+02	--	2.3E+01	5.9E+02	2.5E+03	--	4.7E+02
Tetraethyldithiopyrophosphate	3689-24-5	--	--	--	--	9.8E+00	4.1E+01	--	7.9E+00
Thallium and compounds	7440-28-0	--	--	--	--	2.0E-01	--	--	2.0E-01
Thiobencarb	28249-77-6	--	--	--	--	2.0E+02	8.2E+02	--	1.6E+02
Thiofanox	39196-18-4	--	--	--	--	5.9E+00	2.5E+01	--	4.7E+00
Thiophanate-methyl	23564-05-8	5.8E+01	2.1E+02	--	4.5E+01	5.3E+02	2.2E+03	--	4.3E+02
Thiram	137-26-8	--	--	--	--	2.9E+02	1.2E+03	--	2.4E+02
Tin and compounds	7440-31-5	--	--	--	--	1.2E+04	--	--	1.2E+04
Toluene	108-88-3	--	--	--	--	1.6E+03	--	5.6E+03	1.2E+03
p-Toluidine	106-49-0	2.3E+01	8.2E+01	--	1.8E+01	7.8E+01	3.3E+02	--	6.3E+01
Tralomethrin	66841-25-6	--	--	--	--	1.5E+02	6.2E+02	--	1.2E+02
Triadimefon (Bayleton)	43121-43-3	--	--	--	--	6.6E+02	2.8E+03	--	5.4E+02
Triallate	2303-17-5	9.7E+00	--	--	9.7E+00	4.9E+02	--	--	4.9E+02
Triasulfuron	82097-50-5	--	--	--	--	2.0E+02	8.2E+02	--	1.6E+02
Tribenuron-methyl (Express)	101200-48-0	--	--	--	--	1.6E+02	6.6E+02	--	1.3E+02
1,2,4-Tribromobenzene	615-54-3	--	--	--	--	9.8E+01	--	--	9.8E+01
Tributyltin oxide (TBTO)	56-35-9	--	--	--	--	5.9E+00	2.5E+01	--	4.7E+00
2,4,6-Trichloroaniline	634-93-5	9.9E+01	3.5E+02	--	7.8E+01	5.9E-01	2.5E+00	--	4.7E-01
2,4,6-Trichloroaniline hydrochloride	33663-50-2	2.4E+01	8.5E+01	--	1.9E+01	--	--	--	--
1,2,4-Trichlorobenzene	120-82-1	2.4E+01	--	--	2.4E+01	2.0E+02	--	1.6E+01	1.4E+01
1,1,1-Trichloroethane	71-55-6	--	--	--	--	3.9E+04	--	2.1E+03	2.0E+03
1,1,2-Trichloroethane	79-00-5	1.2E+01	--	1.3E+00	1.1E+00	7.8E+01	--	3.8E-01	3.7E-01
Trichloroethylene (TCE) Long-term +++	79-01-6	3.3E+00	--	5.5E-01	4.7E-01	9.8E+00	--	1.2E+00	1.0E+00
Trichloroethylene (TCE) Short-term ‡	79-01-6	--	--	--	--	--	--	--	--
Trichlorofluoromethane	75-69-4	--	--	--	--	5.9E+03	--	--	5.9E+03
2,4,5-Trichlorophenol	95-95-4	--	--	--	--	2.0E+03	8.2E+03	--	1.6E+03
2,4,6-Trichlorophenol	88-06-2	6.3E+01	2.2E+02	1.8E+06	4.9E+01	2.0E+01	8.2E+01	--	1.6E+01
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	--	--	--	--	2.0E+02	8.2E+02	--	1.6E+02
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	93-72-1	--	--	--	--	1.6E+02	6.6E+02	--	1.3E+02
1,1,2-Trichloropropane	598-77-6	--	--	--	--	9.8E+01	--	--	9.8E+01
1,2,3-Trichloropropane	96-18-4	5.1E-03	--	--	5.1E-03	7.8E+01	--	1.2E+00	1.2E+00
1,2,3-Trichloropropene	96-19-5	--	--	--	--	5.9E+01	--	1.8E-01	1.8E-01
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	--	--	--	--	5.9E+05	--	1.7E+03	1.7E+03
Tridiphane	58138-08-2	--	--	--	--	5.9E+01	2.5E+02	--	4.7E+01
Triethylamine	121-44-8	--	--	--	--	--	--	2.9E+01	2.9E+01
Trifluralin	1582-09-8	9.0E+01	--	--	9.0E+01	1.5E+02	--	--	1.5E+02
1,2,4-Trimethylbenzene	95-63-6	--	--	--	--	2.0E+02	--	1.2E+02	7.6E+01
1,3,5-Trimethylbenzene	108-67-8	--	--	--	--	2.0E+02	--	1.0E+02	6.8E+01
Trimethyl phosphate	512-56-1	3.5E+01	1.2E+02	--	2.7E+01	2.0E+02	8.2E+02	--	1.6E+02
1,3,5-Trinitrobenzene	99-35-4	--	--	--	--	5.9E+02	1.3E+04	--	5.6E+02
Trinitrophenylmethylnitramine (Tetryl)	479-45-8	--	--	--	--	3.9E+01	2.5E+04	--	3.9E+01
2,4,6-Trinitrotoluene (TNT)	118-96-7	2.3E+01	2.6E+02	--	2.1E+01	9.8E+00	1.3E+02	--	9.1E+00
Triphenylphosphine oxide	791-28-6	--	--	--	--	3.9E+02	1.6E+03	--	3.2E+02
Tris(2-chloroethyl) phosphate	115-96-8	3.5E+01	1.2E+02	--	2.7E+01	1.4E+02	5.8E+02	--	1.1E+02
Uranium (chemical toxicity only)	7440-61-0	--	--	--	--	3.9E+00	--	2.1E+04	3.9E+00
Vanadium and compounds +++	7440-62-2	--	--	--	--	9.8E+01	--	5.2E+04	9.8E+01
Vernolate (Vernam)	1929-77-7	--	--	--	--	2.0E+01	--	--	2.0E+01
Vinclozolin	50471-44-8	--	--	--	--	2.3E+01	9.9E+01	--	1.9E+01
Vinyl acetate	108-05-4	--	--	--	--	2.0E+04	--	2.3E+02	2.3E+02
Vinyl bromide	593-60-2	--	--	1.2E-01	1.2E-01	--	--	1.1E+00	1.1E+00

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL SOIL							
		Cancer Risk = 1E-06				Chronic HQ = 0.25			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Vinyl chloride +++	75-01-4	2.1E-01	--	2.2E-01	1.1E-01	5.9E+01	--	2.5E+01	1.7E+01
Warfarin	81-81-2	--	--	--	--	5.9E+00	2.5E+01	--	4.7E+00
Xylenes	1330-20-7	--	--	--	--	3.9E+03	--	1.5E+02	1.4E+02
Zinc	7440-66-6	--	--	--	--	5.9E+03	--	--	5.9E+03
Zinc phosphide	1314-84-7	--	--	--	--	5.9E+00	--	--	5.9E+00
Zineb	12122-67-7	--	--	--	--	9.8E+02	4.1E+03	--	7.9E+02

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	INDUSTRIAL SOIL							
		Cancer Risk = 1E-05				Chronic HQ = 1			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Acephate	30560-19-1	--	--	--	--	1.4E+03	2.6E+03	--	9.1E+02
Acetaldehyde	75-07-0	--	--	4.9E+02	4.9E+02	--	--	3.4E+02	3.4E+02
Acetochlor	34256-82-1	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
Acetone	67-64-1	--	--	--	--	1.1E+06	--	1.9E+06	6.7E+05
Acetone cyanohydrin	75-86-5	--	--	--	--	--	--	1.7E+07	1.7E+07
Acetonitrile	75-05-8	--	--	--	--	--	--	3.4E+03	3.4E+03
Acrolein	107-02-8	--	--	--	--	5.8E+02	--	6.1E-01	6.0E-01
Acrylamide	79-06-1	6.5E+01	1.2E+02	2.4E+06	4.3E+01	2.3E+03	4.3E+03	5.2E+07	1.5E+03
Acrylic acid	79-10-7	--	--	--	--	5.8E+05	--	4.2E+02	4.2E+02
Acrylonitrile	107-13-1	6.1E+01	--	1.4E+01	1.1E+01	4.7E+04	--	6.7E+01	6.7E+01
Alachlor	15972-60-8	5.8E+02	1.1E+03	--	3.8E+02	1.2E+04	2.2E+04	--	7.6E+03
Aldicarb	116-06-3	--	--	--	--	1.2E+03	2.2E+03	--	7.6E+02
Aldicarb sulfone	1646-88-4	--	--	--	--	1.2E+03	2.2E+03	--	7.6E+02
Aldrin	309-00-2	1.9E+00	--	4.3E+01	1.8E+00	3.5E+01	--	--	3.5E+01
Allyl alcohol	107-18-6	--	--	--	--	5.8E+03	--	1.5E+01	1.5E+01
Allyl chloride	107-05-1	1.6E+03	--	3.2E+01	3.2E+01	--	--	6.9E+00	6.9E+00
Aluminum	7429-90-5	--	--	--	--	1.2E+06	--	4.4E+07	1.1E+06
Aluminum phosphide	20859-73-8	--	--	--	--	4.7E+02	--	--	4.7E+02
Ametryn	834-12-8	--	--	--	--	1.1E+04	2.0E+04	--	6.8E+03
m-Aminophenol	591-27-5	--	--	--	--	9.3E+04	1.7E+05	--	6.1E+04
Amitraz	33089-61-1	--	--	--	--	2.9E+03	5.4E+03	--	1.9E+03
Ammonia +++	7664-41-7	--	--	--	--	--	--	4.4E+09	4.4E+09
Ammonium sulfamate	7773-06-0	--	--	--	--	2.3E+05	--	--	2.3E+05
Aniline	62-53-3	5.7E+03	1.1E+04	1.5E+08	3.7E+03	8.2E+03	1.5E+04	8.7E+06	5.3E+03
Antimony and compounds	7440-36-0	--	--	--	--	4.7E+02	--	--	4.7E+02
Antimony pentoxide	1314-60-9	--	--	--	--	5.8E+02	--	--	5.8E+02
Antimony potassium tartrate	28300-74-5	--	--	--	--	1.1E+03	--	--	1.1E+03
Antimony tetroxide	1332-81-6	--	--	--	--	4.7E+02	--	--	4.7E+02
Antimony trioxide	1309-64-4	--	--	--	--	--	--	1.7E+06	1.7E+06
Arsenic (inorganic) +++	7440-38-2	2.2E+01	--	5.7E+04	2.2E+01	3.5E+02	--	1.3E+05	3.5E+02
Arsine	7784-42-1	--	--	--	--	4.1E+00	--	4.4E+05	4.1E+00
Assure	76578-14-8	--	--	--	--	1.1E+04	2.0E+04	--	6.8E+03
Asulam	3337-71-1	--	--	--	--	4.2E+04	7.8E+04	--	2.7E+04
Atrazine	1912-24-9	1.4E+02	2.6E+02	--	9.2E+01	4.1E+04	7.6E+04	--	2.7E+04
Avermectin B1	65195-55-3	--	--	--	--	4.7E+02	8.7E+02	--	3.0E+02
Azobenzene	103-33-3	3.0E+02	--	2.1E+03	2.6E+02	--	--	--	--
Barium and compounds	7440-39-3	--	--	--	--	2.3E+05	--	4.4E+06	2.2E+05
Benfluralin (Benefin)	1861-40-1	--	--	--	--	5.8E+03	--	--	5.8E+03
Bensulfuron-methyl (Londax)	83055-99-6	--	--	--	--	2.3E+05	4.3E+05	--	1.5E+05
Bentazone (Bentazon)	25057-89-0	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
Benzaldehyde	100-52-7	8.2E+03	--	--	8.2E+03	1.2E+05	--	--	1.2E+05
Benzene	71-43-2	5.9E+02	--	5.6E+01	5.1E+01	4.7E+03	--	4.6E+02	4.2E+02
Benzidine	92-87-5	1.4E-01	2.6E-01	3.7E+03	9.2E-02	3.5E+03	6.5E+03	--	2.3E+03
Benzoic acid	65-85-0	--	--	--	--	4.7E+06	8.7E+06	--	3.0E+06
Benzotrichloride	98-07-7	2.5E+00	--	--	2.5E+00	--	--	--	--
Benzyl alcohol	100-51-6	--	--	--	--	1.2E+05	2.2E+05	--	7.6E+04
Benzyl chloride	100-44-7	1.9E+02	--	6.4E+01	4.8E+01	2.3E+03	--	1.1E+02	1.1E+02
Beryllium and compounds	7440-41-7	--	--	1.0E+05	1.0E+05	2.3E+03	--	1.7E+05	2.3E+03
Biphenthrin (Talstar)	82657-04-3	--	--	--	--	1.8E+04	3.3E+04	--	1.1E+04
1,1-Biphenyl	92-52-4	4.1E+03	--	--	4.1E+03	5.8E+05	--	2.0E+02	2.0E+02
Bis(2-chloroethyl)ether	111-44-4	3.0E+01	--	1.6E+01	1.0E+01	--	--	--	--
Bis(chloromethyl)ether	542-88-1	1.5E-01	--	3.7E-03	3.6E-03	--	--	--	--
Bis(2-chloro-1-methylethyl)ether	108-60-1	--	--	--	--	4.7E+04	--	--	4.7E+04
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	2.3E+03	4.3E+03	1.0E+08	1.5E+03	2.3E+04	4.3E+04	--	1.5E+04
Bisphenol A	80-05-7	--	--	--	--	5.8E+04	1.1E+05	--	3.8E+04
Boron	7440-42-8	--	--	--	--	2.3E+05	--	1.7E+08	2.3E+05
Boron trifluoride	7637-07-2	--	--	--	--	4.7E+04	--	1.1E+08	4.7E+04
Bromate	15541-45-4	4.7E+01	--	--	4.7E+01	4.7E+03	--	--	4.7E+03
Bromobenzene	108-86-1	--	--	--	--	9.3E+03	--	2.2E+03	1.8E+03
Bromodichloromethane	75-27-4	5.3E+02	--	1.3E+01	1.3E+01	2.3E+04	--	--	2.3E+04
Bromoform (Tribromomethane)	75-25-2	4.1E+03	--	1.1E+03	8.6E+02	2.3E+04	--	--	2.3E+04

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	INDUSTRIAL SOIL							
		Cancer Risk = 1E-05				Chronic HQ = 1			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Bromomethane	74-83-9	--	--	--	--	1.6E+03	--	3.1E+01	3.0E+01
Bromophos	2104-96-3	--	--	--	--	5.8E+03	--	--	5.8E+03
Bromoxynil	1689-84-5	3.3E+02	6.1E+02	--	2.1E+02	1.8E+04	3.3E+04	--	1.1E+04
Bromoxynil octanoate	1689-99-2	3.3E+02	--	--	3.3E+02	1.8E+04	--	--	1.8E+04
1,3-Butadiene	106-99-0	9.6E+00	--	3.5E+00	2.6E+00	--	--	7.6E+00	7.6E+00
1-Butanol	71-36-3	--	--	--	--	1.2E+05	--	--	1.2E+05
Butylate	2008-41-5	--	--	--	--	5.8E+04	--	--	5.8E+04
Butyl benzyl phthalate	85-68-7	1.7E+04	3.2E+04	--	1.1E+04	2.3E+05	4.3E+05	--	1.5E+05
Butylphthalyl butylglycolate	85-70-1	--	--	--	--	1.2E+06	2.2E+06	--	7.6E+05
Cacodylic acid	75-60-5	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
Cadmium and compounds +++	7440-43-9	--	--	1.4E+05	1.4E+05	1.2E+03	5.4E+03	8.7E+04	9.5E+02
Camphechlor (Toxaphene)	8001-35-2	3.0E+01	5.5E+01	7.7E+05	1.9E+01	--	--	--	--
Caprolactam	105-60-2	--	--	--	--	5.8E+05	1.1E+06	1.9E+07	3.7E+05
Captafol	2425-06-1	2.2E+02	4.1E+02	5.7E+06	1.4E+02	2.3E+03	4.3E+03	--	1.5E+03
Captan	133-06-2	1.4E+04	2.6E+04	3.7E+08	9.2E+03	1.5E+05	2.8E+05	--	9.9E+04
Carbaryl	63-25-2	--	--	--	--	1.2E+05	2.2E+05	--	7.6E+04
Carbofuran	1563-66-2	--	--	--	--	5.8E+03	1.1E+04	--	3.8E+03
Carbon disulfide	75-15-0	--	--	--	--	1.2E+05	--	3.6E+03	3.5E+03
Carbon tetrachloride	56-23-5	4.7E+02	--	3.1E+01	2.9E+01	4.7E+03	--	6.5E+02	5.7E+02
Carbosulfan	55285-14-8	--	--	--	--	1.2E+04	2.2E+04	--	7.6E+03
Carboxin	5234-68-4	--	--	--	--	1.2E+05	2.2E+05	--	7.6E+04
Chloramben	133-90-4	--	--	--	--	1.8E+04	3.3E+04	--	1.1E+04
Chloranil	118-75-2	8.2E+01	1.5E+02	--	5.3E+01	--	--	--	--
Chlordane	12789-03-6	9.3E+01	4.3E+02	1.9E+03	7.4E+01	5.8E+02	2.7E+03	4.7E+03	4.4E+02
Chlordecone (Kepone)	143-50-0	3.3E+00	6.1E+00	5.3E+04	2.1E+00	3.5E+02	6.5E+02	--	2.3E+02
Chlorimuron-ethyl	90982-32-4	--	--	--	--	1.1E+05	2.0E+05	--	6.8E+04
Chlorine	7782-50-5	--	--	--	--	1.2E+05	--	8.0E-01	8.0E-01
Chlorine dioxide	10049-04-4	--	--	--	--	3.5E+04	--	1.7E+06	3.4E+04
Chloroacetic acid	79-11-8	--	--	--	--	--	--	--	--
2-Chloroacetophenone	532-27-4	--	--	--	--	--	--	2.6E+05	2.6E+05
4-Chloroaniline	106-47-8	1.6E+02	3.0E+02	--	1.1E+02	4.7E+03	8.7E+03	--	3.0E+03
Chlorobenzene	108-90-7	--	--	--	--	2.3E+04	--	1.4E+03	1.3E+03
Chlorobenzilate	510-15-6	3.0E+02	5.5E+02	7.9E+06	1.9E+02	2.3E+04	4.3E+04	--	1.5E+04
p-Chlorobenzoic acid	74-11-3	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
4-Chlorobenzotrifluoride	98-56-6	--	--	--	--	3.5E+03	--	8.9E+03	2.5E+03
2-Chloro-1,3-butadiene	126-99-8	--	--	4.4E-01	4.4E-01	2.3E+04	--	9.4E+01	9.4E+01
1-Chlorobutane	109-69-3	--	--	--	--	4.7E+04	--	--	4.7E+04
1-Chloro-1,1-difluoroethane	75-68-3	--	--	--	--	--	--	2.3E+05	2.3E+05
Chlorodifluoromethane	75-45-6	--	--	--	--	--	--	2.1E+05	2.1E+05
2-Chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester sulfurous acid (Aramite)	140-57-8	1.3E+03	2.4E+03	3.4E+07	8.5E+02	5.8E+04	1.1E+05	--	3.8E+04
Chloroform	67-66-3	1.1E+03	--	1.4E+01	1.4E+01	1.2E+04	--	1.1E+03	1.0E+03
Chloromethane	74-87-3	--	--	--	--	--	--	4.6E+02	4.6E+02
4-Chloro-2-methylaniline hydrochloride	3165-93-3	7.1E+01	1.3E+02	--	4.6E+01	--	--	--	--
beta-Chloronaphthalene	91-58-7	--	--	--	--	9.3E+04	1.3E+05	--	5.5E+04
o-Chloronitrobenzene	88-73-3	1.1E+02	2.0E+02	--	7.1E+01	3.5E+03	6.5E+03	8.7E+04	2.2E+03
p-Chloronitrobenzene	100-00-5	5.5E+02	1.0E+03	--	3.5E+02	8.2E+02	1.5E+03	1.7E+07	5.3E+02
2-Chlorophenol	95-57-8	--	--	--	--	5.8E+03	--	--	5.8E+03
Chlorothalonil	1897-45-6	1.1E+04	2.0E+04	2.8E+08	6.9E+03	1.8E+04	3.3E+04	--	1.1E+04
o-Chlorotoluene	95-49-8	--	--	--	--	2.3E+04	--	--	2.3E+04
Chlorpropham	101-21-3	--	--	--	--	5.8E+04	1.1E+05	--	3.8E+04
Chlorpyrifos	2921-88-2	--	--	--	--	1.2E+03	2.2E+03	--	7.6E+02
Chlorpyrifos-methyl	5598-13-0	--	--	--	--	1.2E+04	2.2E+04	--	7.6E+03
Chlorsulfuron	64902-72-3	--	--	--	--	5.8E+04	1.1E+05	--	3.8E+04
Chlorthiophos	60238-56-4	--	--	--	--	9.3E+02	1.7E+03	--	6.1E+02
Chromium, Total	7440-47-3	--	--	--	--	--	--	--	--
Chromium III *	16065-83-1	--	--	--	--	1.8E+06	--	--	1.8E+06
Chromium VI +++	18540-29-9	6.5E+01	--	2.9E+03	6.4E+01	3.5E+03	--	8.7E+05	3.5E+03
Clofentezine (Apollo)	74115-24-5	--	--	--	--	1.5E+04	2.8E+04	--	9.9E+03
Cobalt	7440-48-4	--	--	2.7E+04	2.7E+04	3.5E+02	--	5.2E+04	3.5E+02
Coke Oven Emissions	8007-45-2	--	--	4.0E+05	4.0E+05	--	--	--	--
Copper and compounds	7440-50-8	--	--	--	--	4.7E+04	--	--	4.7E+04

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	INDUSTRIAL SOIL							
		Cancer Risk = 1E-05				Chronic HQ = 1			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Crotonaldehyde	123-73-9	1.7E+01	--	--	1.7E+01	1.2E+03	--	--	1.2E+03
Cumene (Isopropylbenzene)	98-82-8	--	--	--	--	1.2E+05	--	1.1E+04	9.9E+03
Cyanazine	21725-46-2	3.9E+01	7.2E+01	--	2.5E+01	2.3E+03	4.3E+03	--	1.5E+03
Cyanide (free)	57-12-5	--	--	--	--	7.0E+02	--	1.9E+02	1.5E+02
Cyanide (hydrogen)	74-90-8	--	--	--	--	7.0E+02	--	1.8E+02	1.5E+02
Cyanogen	460-19-5	--	--	--	--	1.2E+03	--	--	1.2E+03
Cyanogen bromide	506-68-3	--	--	--	--	1.1E+05	--	--	1.1E+05
Cyanogen chloride	506-77-4	--	--	--	--	5.8E+04	--	--	5.8E+04
Cyclohexane	110-82-7	--	--	--	--	--	--	2.7E+04	2.7E+04
Cyclohexanone	108-94-1	--	--	--	--	5.8E+06	--	1.3E+05	1.3E+05
Cyclohexylamine	108-91-8	--	--	--	--	2.3E+05	--	--	2.3E+05
Cyfluthrin (Baythroid)	68359-37-5	--	--	--	--	2.9E+04	5.4E+04	--	1.9E+04
Cyhalothrin (Karate)	68085-85-8	--	--	--	--	1.2E+03	2.2E+03	--	7.6E+02
Cyromazine	66215-27-8	--	--	--	--	5.8E+05	1.1E+06	--	3.8E+05
Dacthal	1861-32-1	--	--	--	--	1.2E+04	2.2E+04	--	7.6E+03
Dalapon	75-99-0	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
Daminozide (Alar)	1596-84-5	1.8E+03	3.4E+03	4.8E+07	1.2E+03	1.8E+05	3.3E+05	--	1.1E+05
Demeton	8065-48-3	--	--	--	--	4.7E+01	8.7E+01	--	3.0E+01
Diallate	2303-16-4	5.4E+02	1.0E+03	--	3.5E+02	--	--	--	--
Diazinon	333-41-5	--	--	--	--	8.2E+02	1.5E+03	--	5.3E+02
Dibenzofuran	132-64-9	--	--	--	--	1.2E+03	7.2E+03	--	1.0E+03
1,4-Dibromobenzene	106-37-6	--	--	--	--	1.2E+04	--	--	1.2E+04
Dibromochloromethane	124-48-1	3.9E+02	--	--	3.9E+02	2.3E+04	--	--	2.3E+04
1,2-Dibromo-3-chloropropane	96-12-8	4.1E+01	--	6.5E-01	6.4E-01	2.3E+02	--	2.8E+01	2.5E+01
1,2-Dibromoethane	106-93-4	1.6E+01	--	1.8E+00	1.6E+00	1.1E+04	--	3.4E+02	3.3E+02
Dibutyl phthalate	84-74-2	--	--	--	--	1.2E+05	2.2E+05	--	7.6E+04
Dicamba	1918-00-9	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
1,2-Dichlorobenzene	95-50-1	--	--	--	--	1.1E+05	--	1.0E+04	9.3E+03
1,4-Dichlorobenzene	106-46-7	6.1E+03	--	1.2E+02	1.1E+02	8.2E+04	--	3.7E+04	2.5E+04
3,3-Dichlorobenzidine	91-94-1	7.3E+01	1.4E+02	7.2E+05	4.7E+01	--	--	--	--
4,4'-Dichlorobenzophenone	90-98-2	--	--	--	--	1.1E+04	2.0E+04	--	6.8E+03
1,4-Dichloro-2-butene	764-41-0	--	--	9.4E-02	9.4E-02	--	--	--	--
Dichlorodifluoromethane	75-71-8	--	--	--	--	2.3E+05	--	3.7E+02	3.7E+02
p,p'-Dichlorodiphenyldichloroethane (DDD)	72-54-8	1.4E+02	2.5E+02	3.5E+06	8.9E+01	3.5E+01	6.5E+01	--	2.3E+01
p,p'-Dichlorodiphenyldichloroethylene (DDE)	72-55-9	9.6E+01	--	2.7E+03	9.3E+01	3.5E+02	--	--	3.5E+02
p,p'-Dichlorodiphenyltrichloroethane (DDT)	50-29-3	9.6E+01	6.0E+02	2.5E+06	8.3E+01	5.8E+02	3.6E+03	--	5.0E+02
1,1-Dichloroethane	75-34-3	5.7E+03	--	1.6E+02	1.6E+02	2.3E+05	--	--	2.3E+05
1,2-Dichloroethane	107-06-2	3.6E+02	--	2.2E+01	2.0E+01	7.0E+03	--	1.4E+02	1.4E+02
1,1-Dichloroethylene	75-35-4	--	--	--	--	5.8E+04	--	1.0E+03	1.0E+03
1,2-Dichloroethylene (cis)	156-59-2	--	--	--	--	2.3E+03	--	--	2.3E+03
1,2-Dichloroethylene (trans)	156-60-5	--	--	--	--	2.3E+04	--	--	2.3E+04
2,4-Dichlorophenol	120-83-2	--	--	--	--	3.5E+03	6.5E+03	--	2.3E+03
2,4-Dichlorophenoxy acetic acid (2,4-D)	94-75-7	--	--	--	--	1.2E+04	4.3E+04	--	9.2E+03
2,4-Dichlorophenoxy butyric acid (2,4-DB)	94-82-6	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
Decabromodiphenyl ether (BDE-209)	1163-19-5	4.7E+04	8.7E+04	--	3.0E+04	8.2E+03	1.5E+04	--	5.3E+03
1,2-Dichloropropane	78-87-5	8.8E+02	--	1.3E+02	1.1E+02	4.7E+04	--	6.6E+01	6.6E+01
2,3-Dichloropropanol	616-23-9	--	--	--	--	3.5E+03	6.5E+03	--	2.3E+03
1,3-Dichloropropene	542-75-6	3.3E+02	--	1.1E+02	8.2E+01	3.5E+04	--	3.1E+02	3.1E+02
Dichlorvos	62-73-7	1.1E+02	2.1E+02	3.0E+06	7.3E+01	5.8E+02	1.1E+03	4.4E+06	3.8E+02
Dicrotophos (Bidrin)	141-66-2	--	--	--	--	3.5E+01	6.5E+01	--	2.3E+01
Dicyclopentadiene	77-73-6	--	--	--	--	9.3E+04	--	5.4E+00	5.4E+00
Dieldrin	60-57-1	2.0E+00	3.8E+00	5.3E+04	1.3E+00	5.8E+01	1.1E+02	--	3.8E+01
Diethylene glycol, monobutyl ether	112-34-5	--	--	--	--	3.5E+04	6.5E+04	8.7E+05	2.2E+04
Diethylene glycol, monoethyl ether	111-90-0	--	--	--	--	7.0E+04	1.3E+05	2.6E+06	4.5E+04
Diethylformamide	617-84-5	--	--	--	--	1.2E+03	--	--	1.2E+03
Di(2-ethylhexyl)adipate	103-23-1	2.7E+04	5.1E+04	--	1.8E+04	7.0E+05	1.3E+06	--	4.6E+05
Diethyl phthalate	84-66-2	--	--	--	--	9.3E+05	1.7E+06	--	6.1E+05
Diethylstilbestrol	56-53-1	9.3E-02	1.7E-01	2.4E+03	6.1E-02	--	--	--	--
Difenzoquat (Avenge)	43222-48-6	--	--	--	--	9.7E+04	1.8E+05	--	6.3E+04
Diflubenzuron	35367-38-5	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
1,1-Difluoroethane	75-37-6	--	--	--	--	--	--	2.0E+05	2.0E+05

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	INDUSTRIAL SOIL							
		Cancer Risk = 1E-05				Chronic HQ = 1			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Diisopropyl methylphosphonate (DIMP)	1445-75-6	--	--	--	--	9.3E+04	--	--	9.3E+04
Dimethipin	55290-64-7	--	--	--	--	2.6E+04	4.8E+04	--	1.7E+04
Dimethoate	60-51-5	--	--	--	--	2.6E+03	4.8E+03	--	1.7E+03
3,3'-Dimethoxybenzidine	119-90-4	2.0E+01	3.8E+01	--	1.3E+01	--	--	--	--
N-N-Dimethylaniline	121-69-7	1.2E+03	--	--	1.2E+03	2.3E+03	--	--	2.3E+03
2,4-Dimethylaniline	95-68-1	1.6E+02	3.0E+02	--	1.1E+02	2.3E+03	4.3E+03	--	1.5E+03
2,4-Dimethylaniline hydrochloride	21436-96-4	5.6E+01	1.0E+02	--	3.7E+01	--	--	--	--
3,3'-Dimethylbenzidine	119-93-7	3.0E+00	5.5E+00	--	1.9E+00	--	--	--	--
N,N-Dimethylformamide	68-12-2	--	--	--	--	1.2E+05	--	1.7E+04	1.5E+04
2,4-Dimethylphenol	105-67-9	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
2,6-Dimethylphenol	576-26-1	--	--	--	--	7.0E+02	1.3E+03	--	4.6E+02
3,4-Dimethylphenol	95-65-8	--	--	--	--	1.2E+03	2.2E+03	--	7.6E+02
Dimethyl terephthalate	120-61-6	--	--	--	--	1.2E+05	--	--	1.2E+05
4,6-Dinitro-o-cyclohexyl phenol	131-89-5	--	--	--	--	2.3E+03	4.3E+03	--	1.5E+03
1,2-Dinitrobenzene	528-29-0	--	--	--	--	1.2E+02	2.2E+02	--	7.6E+01
1,3-Dinitrobenzene	99-65-0	--	--	--	--	1.2E+02	2.2E+02	--	7.6E+01
1,4-Dinitrobenzene	100-25-4	--	--	--	--	1.2E+02	2.2E+02	--	7.6E+01
2,4-Dinitrophenol	51-28-5	--	--	--	--	2.3E+03	4.3E+03	--	1.5E+03
Dinitrotoluene mixture	25321-14-6	7.3E+01	1.4E+02	--	4.7E+01	1.1E+03	2.0E+03	--	6.8E+02
2,4-Dinitrotoluene	121-14-2	1.1E+02	1.9E+02	2.8E+06	6.8E+01	2.3E+03	4.3E+03	--	1.5E+03
2,6-Dinitrotoluene	606-20-2	2.2E+01	4.1E+01	--	1.4E+01	3.5E+02	6.6E+02	--	2.3E+02
Dinoseb	88-85-7	--	--	--	--	1.2E+03	2.2E+03	--	7.6E+02
1,4-Dioxane	123-91-1	3.3E+02	--	9.7E+02	2.4E+02	3.5E+04	--	5.2E+03	4.5E+03
Diphenamid	957-51-7	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
Diphenylamine	122-39-4	--	--	--	--	1.2E+05	2.2E+05	--	7.6E+04
N,N-Diphenyl-1,4 benzenediamine (DPPD)	74-31-7	--	--	--	--	3.5E+02	6.5E+02	--	2.3E+02
1,2-Diphenylhydrazine	122-66-7	4.1E+01	7.6E+01	1.1E+06	2.7E+01	--	--	--	--
Diphenyl sulfone	127-63-9	--	--	--	--	9.3E+02	1.7E+03	--	6.1E+02
Diquat dibromide (Diquat)	85-00-7	--	--	--	--	2.6E+03	4.8E+03	--	1.7E+03
Direct black 38	1937-37-7	4.6E+00	8.6E+00	1.7E+03	3.0E+00	--	--	--	--
Direct blue 6	2602-46-2	4.4E+00	8.2E+00	1.7E+03	2.9E+00	--	--	--	--
Direct brown 95	16071-86-6	4.9E+00	9.1E+00	1.7E+03	3.2E+00	--	--	--	--
Disulfoton	298-04-4	--	--	--	--	4.7E+01	8.7E+01	--	3.0E+01
1,4-Dithiane	505-29-3	--	--	--	--	1.2E+04	--	--	1.2E+04
Diuron	330-54-1	--	--	--	--	2.3E+03	4.3E+03	--	1.5E+03
Dodine	2439-10-3	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
Endosulfan	115-29-7	--	--	--	--	7.0E+03	--	--	7.0E+03
Endothall	145-73-3	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
Endrin	72-20-8	--	--	--	--	3.5E+02	6.5E+02	--	2.3E+02
Enilconazole (Imazalil)	35554-44-0	5.4E+02	1.0E+03	--	3.5E+02	2.9E+03	5.4E+03	--	1.9E+03
Epichlorohydrin	106-89-8	3.3E+03	--	1.9E+03	1.2E+03	7.0E+03	--	8.3E+01	8.2E+01
1,2-Epoxybutane	106-88-7	--	--	--	--	--	--	6.7E+02	6.7E+02
S-Ethyl dipropylthiocarbamate (EPTC)	759-94-4	--	--	--	--	5.8E+04	--	--	5.8E+04
2-Chloroethyl phosphonic acid (Ethephon)	16672-87-0	--	--	--	--	5.8E+03	1.1E+04	--	3.8E+03
Ethion	563-12-2	--	--	--	--	5.8E+02	1.1E+03	--	3.8E+02
2-Ethoxyethanol	110-80-5	--	--	--	--	1.1E+05	--	8.6E+04	4.7E+04
2-Ethoxyethanol acetate	111-15-9	--	--	--	--	1.2E+05	--	1.6E+04	1.4E+04
Ethyl acetate	141-78-6	--	--	--	--	1.1E+06	--	2.6E+03	2.6E+03
Ethyl acrylate	140-88-5	--	--	--	--	5.8E+03	--	2.2E+02	2.1E+02
Ethylbenzene	100-41-4	3.0E+03	--	2.8E+02	2.5E+02	1.2E+05	--	2.5E+04	2.0E+04
Ethyl chloride (Chloroethane)	75-00-3	--	--	--	--	--	--	5.7E+04	5.7E+04
Ethylene cyanohydrin	109-78-4	--	--	--	--	8.2E+04	1.5E+05	--	5.3E+04
Ethylene diamine	107-15-3	--	--	--	--	1.1E+05	--	--	1.1E+05
Ethylene glycol	107-21-1	--	--	--	--	2.3E+06	4.3E+06	3.5E+09	1.5E+06
Ethylene glycol, monobutyl ether	111-76-2	--	--	--	--	1.2E+05	2.2E+05	1.4E+10	7.6E+04
Ethylene oxide	75-21-8	1.1E+02	--	2.5E-01	2.5E-01	--	--	8.0E+02	8.0E+02
Ethylene thiourea (ETU)	96-45-7	7.3E+02	1.4E+03	1.9E+07	4.7E+02	9.3E+01	1.7E+02	--	6.1E+01
Ethyl ether	60-29-7	--	--	--	--	2.3E+05	--	--	2.3E+05
Ethyl methacrylate	97-63-2	--	--	--	--	--	--	7.6E+03	7.6E+03
Ethyl p-nitrophenyl phenylphosphorothioate (EPN)	2104-64-5	--	--	--	--	1.2E+01	2.2E+01	--	7.6E+00
Ethylphthalyl ethyl glycolate	84-72-0	--	--	--	--	3.5E+06	6.5E+06	--	2.3E+06

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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CONTAMINANT	CAS No.	INDUSTRIAL SOIL							
		Cancer Risk = 1E-05				Chronic HQ = 1			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Fenamiphos	22224-92-6	--	--	--	--	2.9E+02	5.4E+02	--	1.9E+02
Fenpropathrin (Danitol)	39515-41-8	--	--	--	--	2.9E+04	5.4E+04	--	1.9E+04
Fenvalerate (Pydrin)	51630-58-1	--	--	--	--	2.9E+04	5.4E+04	--	1.9E+04
Fluometuron	2164-17-2	--	--	--	--	1.5E+04	2.8E+04	--	9.9E+03
Fluoride	16984-48-8	--	--	--	--	4.7E+04	--	1.1E+08	4.7E+04
Fluoridone	59756-60-4	--	--	--	--	9.3E+04	1.7E+05	--	6.1E+04
Flurprimidol	56425-91-3	--	--	--	--	4.7E+04	8.7E+04	--	3.0E+04
Flusilazole (NuStar)	85509-19-9	--	--	--	--	2.3E+03	--	--	2.3E+03
Flutolanil	66332-96-5	--	--	--	--	5.8E+05	1.1E+06	--	3.8E+05
Fluvalinate	69409-94-5	--	--	--	--	1.2E+04	2.2E+04	--	7.6E+03
Folpet	133-07-3	--	--	--	--	1.1E+05	2.0E+05	--	6.8E+04
Fomesafen	72178-02-0	--	--	--	--	2.9E+03	5.4E+03	--	1.9E+03
Fonofos	944-22-9	--	--	--	--	2.3E+03	4.3E+03	--	1.5E+03
Formaldehyde	50-00-0	--	--	7.3E+02	7.3E+02	2.3E+05	--	3.3E+03	3.3E+03
Formic acid	64-18-6	--	--	--	--	1.1E+06	--	1.2E+02	1.2E+02
Fosetyl-al	39148-24-8	--	--	--	--	2.9E+06	5.4E+06	--	1.9E+06
Furan	110-00-9	--	--	--	--	1.2E+03	7.2E+03	--	1.0E+03
Furazolidone	67-45-8	8.6E+00	1.6E+01	--	5.6E+00	--	--	--	--
Furfural	98-01-1	--	--	--	--	3.5E+03	--	1.1E+04	2.6E+03
Furmecyclox	60568-05-0	1.1E+03	2.0E+03	2.8E+07	7.1E+02	--	--	--	--
Furothiazole (Furium)	531-82-8	2.2E+01	4.1E+01	5.7E+05	1.4E+01	--	--	--	--
Glufosinate-ammonium	77182-82-2	--	--	--	--	7.0E+03	1.3E+04	--	4.6E+03
Glycidaldehyde	765-34-4	--	--	--	--	4.7E+02	--	3.7E+02	2.1E+02
Glyphosate	1071-83-6	--	--	--	--	1.2E+05	2.2E+05	--	7.6E+04
Haloxyfop-methyl	69806-40-2	--	--	--	--	5.8E+01	1.1E+02	--	3.8E+01
Thifensulfuron-methyl (Harmony)	79277-27-3	--	--	--	--	5.0E+04	9.3E+04	--	3.3E+04
Heptachlor	76-44-8	7.3E+00	--	4.5E+01	6.3E+00	5.8E+02	--	--	5.8E+02
Heptachlor epoxide	1024-57-3	3.6E+00	--	4.0E+01	3.3E+00	1.5E+01	--	--	1.5E+01
Hexabromobenzene	87-82-1	--	--	--	--	2.3E+03	--	--	2.3E+03
Hexachlorobenzene	118-74-1	2.0E+01	--	1.8E+01	9.6E+00	9.3E+02	--	--	9.3E+02
Hexachlorobutadiene	87-68-3	4.2E+02	--	6.0E+01	5.3E+01	1.2E+03	--	--	1.2E+03
alpha-Hexachlorocyclohexane (alpha-HCH)	319-84-6	5.2E+00	9.6E+00	1.4E+05	3.4E+00	9.3E+03	1.7E+04	--	6.1E+03
beta-Hexachlorocyclohexane (beta-HCH)	319-85-7	1.8E+01	3.4E+01	4.6E+05	1.2E+01	--	--	--	--
gamma-Hexachlorocyclohexane (Lindane)	58-89-9	3.0E+01	1.4E+02	7.9E+05	2.4E+01	3.5E+02	1.6E+03	--	2.9E+02
Hexachlorocyclohexane technical	608-73-1	1.8E+01	3.4E+01	4.8E+05	1.2E+01	--	--	--	--
Hexachlorocyclopentadiene	77-47-4	--	--	--	--	7.0E+03	--	7.5E+00	7.5E+00
Hexachloroethane	67-72-1	8.2E+02	--	8.9E+01	8.0E+01	8.2E+02	--	1.1E+03	4.6E+02
Hexachlorophene	70-30-4	--	--	--	--	3.5E+02	6.5E+02	--	2.3E+02
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX/Cyclonite)	121-82-4	3.0E+02	3.7E+03	--	2.8E+02	3.5E+03	4.3E+04	--	3.2E+03
1,6-Hexamethylene diisocyanate	822-06-0	--	--	--	--	--	--	1.3E+01	1.3E+01
n-Hexane	110-54-3	--	--	--	--	--	--	2.5E+03	2.5E+03
Hexazinone	51235-04-2	--	--	--	--	3.9E+04	7.2E+04	--	2.5E+04
Hexythiazox (Savey)	78587-05-0	--	--	--	--	2.9E+04	5.4E+04	--	1.9E+04
Hydramethylnon (Amdro)	67485-29-4	--	--	--	--	2.0E+04	3.7E+04	--	1.3E+04
Hydrazine, hydrazine sulfate	302-01-2	1.1E+01	--	5.0E+04	1.1E+01	--	--	2.6E+05	2.6E+05
Hydrazine, dimethyl	57-14-7	--	--	--	--	1.2E+02	--	2.4E-01	2.4E-01
Hydrogen chloride	7647-01-0	--	--	--	--	--	--	1.7E+08	1.7E+08
Hydrogen sulfide	7783-06-4	--	--	--	--	--	--	1.7E+07	1.7E+07
p-Hydroquinone	123-31-9	5.5E+02	1.0E+03	--	3.5E+02	4.7E+04	8.7E+04	--	3.0E+04
Imazaquin	81335-37-7	--	--	--	--	2.9E+05	5.4E+05	--	1.9E+05
Imazethapyr (Pursuit)	81335-77-5	--	--	--	--	2.9E+06	5.4E+06	--	1.9E+06
Iprodione	36734-19-7	--	--	--	--	4.7E+04	8.7E+04	--	3.0E+04
Iron	7439-89-6	--	--	--	--	8.2E+05	--	--	8.2E+05
Isobutanol (Isobutyl alcohol)	78-83-1	--	--	--	--	3.5E+05	--	--	3.5E+05
Isophorone	78-59-1	3.4E+04	6.4E+04	--	2.2E+04	2.3E+05	4.3E+05	1.7E+10	1.5E+05
Isopropalin	33820-53-0	--	--	--	--	1.8E+04	--	--	1.8E+04
Isopropyl methyl phosphonic acid	1832-54-8	--	--	--	--	1.2E+05	2.2E+05	--	7.6E+04
Isoxaben	82558-50-7	--	--	--	--	5.8E+04	1.1E+05	--	3.8E+04
Lactofen	77501-63-4	--	--	--	--	9.3E+03	1.7E+04	--	6.1E+03
Lead +++	7439-92-1	--	--	--	--	--	--	--	--
Lead (tetraethyl)	78-00-2	--	--	--	--	1.2E-01	--	--	1.2E-01

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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CONTAMINANT	CAS No.	INDUSTRIAL SOIL							
		Cancer Risk = 1E-05				Chronic HQ = 1			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Linuron	330-55-2	--	--	--	--	9.0E+03	1.7E+04	--	5.8E+03
Lithium	7439-93-2	--	--	--	--	2.3E+03	--	--	2.3E+03
Malathion	121-75-5	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
Maleic anhydride	108-31-6	--	--	--	--	1.2E+05	2.2E+05	6.1E+06	7.5E+04
Maleic hydrazide	123-33-1	--	--	--	--	5.8E+05	1.1E+06	--	3.8E+05
Malononitrile	109-77-3	--	--	--	--	1.2E+02	2.2E+02	--	7.6E+01
Mancozeb	8018-01-7	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
Maneb	12427-38-2	--	--	--	--	5.8E+03	1.1E+04	--	3.8E+03
Manganese (non-food) +++	7439-96-5	--	--	--	--	1.6E+05	--	4.4E+05	1.2E+05
Mephosfolan	950-10-7	--	--	--	--	1.1E+02	2.0E+02	--	6.8E+01
Mepiquat chloride (Mepiquat)	24307-26-4	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
Mercury and compounds	7487-94-7	--	--	--	--	3.5E+02	--	2.6E+06	3.5E+02
Mercury (elemental)	7439-97-6	--	--	--	--	--	--	4.6E+01	4.6E+01
Mercury (methyl)	22967-92-6	--	--	--	--	1.2E+02	--	--	1.2E+02
Merphos	150-50-5	--	--	--	--	3.5E+01	--	--	3.5E+01
Merphos oxide	78-48-8	--	--	--	--	1.2E+02	2.2E+02	--	7.6E+01
Metalaxyl	57837-19-1	--	--	--	--	7.0E+04	1.3E+05	--	4.6E+04
Methacrylonitrile	126-98-7	--	--	--	--	1.2E+02	--	8.9E+02	1.0E+02
Methamidophos	10265-92-6	--	--	--	--	5.8E+01	1.1E+02	--	3.8E+01
Methanol	67-56-1	--	--	--	--	2.3E+06	--	2.5E+06	1.2E+06
Methidathion	950-37-8	--	--	--	--	1.8E+03	3.3E+03	--	1.1E+03
Methomyl	16752-77-5	--	--	--	--	2.9E+04	5.4E+04	--	1.9E+04
Methoxychlor	72-43-5	--	--	--	--	5.8E+03	1.1E+04	--	3.8E+03
2-Methoxyethanol	109-86-4	--	--	--	--	5.8E+03	--	8.8E+03	3.5E+03
2-Methoxyethanol acetate	110-49-6	--	--	--	--	9.3E+03	--	5.4E+02	5.1E+02
2-Methoxy-5-nitroaniline	99-59-2	6.7E+02	1.2E+03	1.7E+07	4.3E+02	--	--	--	--
Methyl acetate	79-20-9	--	--	--	--	1.2E+06	--	--	1.2E+06
Methyl acrylate	96-33-3	--	--	--	--	--	--	6.1E+02	6.1E+02
2-Methylaniline hydrochloride	636-21-5	2.5E+02	4.7E+02	6.6E+06	1.6E+02	--	--	--	--
Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	17804-35-2	--	--	--	--	5.8E+04	1.1E+05	--	3.8E+04
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	94-74-6	--	--	--	--	5.8E+02	1.1E+03	--	3.8E+02
4-(2-Methyl-4-chlorophenoxy) butyric acid (MCPB)	94-81-5	--	--	--	--	5.1E+03	9.6E+03	--	3.3E+03
2-(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)	93-65-2	--	--	--	--	1.2E+03	2.2E+03	--	7.6E+02
4,4'-Methylenebisbenzeneamine	101-77-9	2.0E+01	3.8E+01	5.3E+05	1.3E+01	--	--	1.7E+08	1.7E+08
4,4'-Methylene bis(2-chloroaniline)	101-14-4	3.3E+02	6.1E+02	5.7E+05	2.1E+02	2.3E+03	4.3E+03	--	1.5E+03
4,4'-Methylene bis(N,N'-dimethyl)aniline	101-61-1	7.1E+02	1.3E+03	1.9E+07	4.6E+02	--	--	--	--
Methylene bromide	74-95-3	--	--	--	--	--	--	9.9E+01	9.9E+01
Methylene chloride	75-09-2	1.6E+04	--	2.7E+04	1.0E+04	7.0E+03	--	5.8E+03	3.2E+03
4,4'-Methylenediphenyl isocyanate	101-68-8	--	--	--	--	--	--	5.2E+06	5.2E+06
2-(1-Methylethoxy)phenol methylcarbamate (Baygon)	114-26-1	--	--	--	--	4.7E+03	8.7E+03	--	3.0E+03
Methyl ethyl ketone (2-Butanone)	78-93-3	--	--	--	--	7.0E+05	--	2.7E+05	1.9E+05
Methyl isobutyl ketone (4-Methyl-2-pentanone)	108-10-1	--	--	--	--	--	--	1.4E+05	1.4E+05
Methyl methacrylate	80-62-6	--	--	--	--	1.6E+06	--	1.9E+04	1.9E+04
2-Methyl-5-nitroaniline	99-55-8	3.6E+03	6.8E+03	--	2.4E+03	2.3E+04	4.3E+04	--	1.5E+04
Methyl parathion	298-00-0	--	--	--	--	2.9E+02	5.4E+02	--	1.9E+02
2-Methylphenol	95-48-7	--	--	--	--	5.8E+04	1.1E+05	5.2E+09	3.8E+04
3-Methylphenol	108-39-4	--	--	--	--	5.8E+04	1.1E+05	5.2E+09	3.8E+04
4-Methylphenol	106-44-5	--	--	--	--	1.2E+05	2.2E+05	5.2E+09	7.6E+04
Methyl phosphonic acid	993-13-5	--	--	--	--	7.0E+04	1.3E+05	--	4.6E+04
Methyl styrene (mixture)	25013-15-4	--	--	--	--	7.0E+03	--	4.3E+03	2.6E+03
Methyl styrene (alpha)	98-83-9	--	--	--	--	8.2E+04	--	--	8.2E+04
Methyl tertbutyl ether (MTBE)	1634-04-4	1.8E+04	--	2.3E+03	2.1E+03	--	--	6.4E+04	6.4E+04
Metolaclor (Dual)	51218-45-2	--	--	--	--	1.8E+05	3.3E+05	--	1.1E+05
Metribuzin	21087-64-9	--	--	--	--	2.9E+04	5.4E+04	--	1.9E+04
Metsulfuron-methyl (Ally)	74223-64-6	--	--	--	--	2.9E+05	5.4E+05	--	1.9E+05
Mirex	2385-85-5	1.8E+00	--	2.1E+01	1.7E+00	2.3E+02	--	--	2.3E+02
Molinate	2212-67-1	--	--	--	--	2.3E+03	4.3E+03	--	1.5E+03
Molybdenum	7439-98-7	--	--	--	--	5.8E+03	--	--	5.8E+03
Monochloramine	10599-90-3	--	--	--	--	1.2E+05	--	--	1.2E+05
Myclobutanil (Systhane)	88671-89-0	--	--	--	--	2.9E+04	5.4E+04	--	1.9E+04
Naled	300-76-5	--	--	--	--	2.3E+03	--	--	2.3E+03

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	INDUSTRIAL SOIL							
		Cancer Risk = 1E-05				Chronic HQ = 1			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Napropamide	15299-99-7	--	--	--	--	1.4E+05	2.6E+05	--	9.1E+04
Nickel and compounds	7440-02-0	--	--	9.4E+05	9.4E+05	2.3E+04	--	7.9E+05	2.3E+04
Nickel refinery dust	7440-02-0-NRD	--	--	1.0E+06	1.0E+06	1.3E+04	--	1.2E+05	1.2E+04
Nickel subsulfide	12035-72-2	1.9E+01	--	5.1E+05	1.9E+01	1.3E+04	--	1.2E+05	1.2E+04
Nitrate	14797-55-8	--	--	--	--	1.9E+06	--	--	1.9E+06
Nitrite	14797-65-0	--	--	--	--	1.2E+05	--	--	1.2E+05
2-Nitroaniline	88-74-4	--	--	--	--	1.2E+04	2.2E+04	4.4E+05	7.5E+03
Nitrobenzene	98-95-3	--	--	2.2E+02	2.2E+02	2.3E+03	--	2.9E+03	1.3E+03
Nitrofurantoin	67-20-9	--	--	--	--	8.2E+04	1.5E+05	--	5.3E+04
Nitrofurazone	59-87-0	2.5E+01	4.7E+01	6.6E+05	1.6E+01	--	--	--	--
Nitroglycerin	55-63-0	1.9E+03	3.6E+03	--	1.3E+03	1.2E+02	2.2E+02	--	7.6E+01
Nitroguanidine	556-88-7	--	--	--	--	1.2E+05	2.2E+05	--	7.6E+04
2-Nitropropane	79-46-9	--	--	6.0E-01	6.0E-01	--	--	1.2E+03	1.2E+03
N-Nitrosodi-n-butylamine	924-16-3	6.1E+00	--	1.9E+01	4.6E+00	--	--	--	--
N-Nitrosodiethanolamine	1116-54-7	1.2E+01	2.2E+01	3.1E+05	7.6E+00	--	--	--	--
N-Nitrosodiethylamine	55-18-5	2.2E-01	4.1E-01	5.7E+03	1.4E-01	--	--	--	--
N-Nitrosodimethylamine	62-75-9	6.4E-01	--	7.2E-01	3.4E-01	9.3E+00	--	1.4E+01	5.7E+00
N-Nitrosodiphenylamine	86-30-6	6.7E+03	1.2E+04	9.4E+07	4.3E+03	--	--	--	--
N-Nitroso di-n-propylamine	621-64-7	4.7E+00	8.7E+00	1.2E+05	3.0E+00	--	--	--	--
N-Nitroso-N-methylethylamine	10595-95-6	1.5E+00	--	2.4E+00	9.1E-01	--	--	--	--
N-Nitrosopyrrolidine	930-55-2	1.6E+01	2.9E+01	4.0E+05	1.0E+01	--	--	--	--
m-Nitrotoluene	99-08-1	--	--	--	--	1.2E+02	2.2E+02	--	7.6E+01
o-Nitrotoluene	88-72-2	1.5E+02	--	--	1.5E+02	1.1E+03	--	--	1.1E+03
p-Nitrotoluene	99-99-0	2.0E+03	3.8E+03	--	1.3E+03	4.7E+03	8.7E+03	--	3.0E+03
Norflurazon	27314-13-2	--	--	--	--	1.8E+04	3.3E+04	--	1.1E+04
Octabromodiphenyl ether	32536-52-0	--	--	--	--	3.5E+03	6.5E+03	--	2.3E+03
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	--	--	--	--	5.8E+04	1.8E+06	--	5.7E+04
Octamethylpyrophosphoramide	152-16-9	--	--	--	--	2.3E+03	4.3E+03	--	1.5E+03
Oryzalin	19044-88-3	4.2E+03	7.8E+03	--	2.7E+03	1.6E+05	3.0E+05	--	1.1E+05
Oxadiazon	19666-30-9	--	--	--	--	5.8E+03	1.1E+04	--	3.8E+03
Oxamyl	23135-22-0	--	--	--	--	2.9E+04	5.4E+04	--	1.9E+04
Oxyfluorfen	42874-03-3	4.5E+02	8.3E+02	--	2.9E+02	3.5E+04	6.5E+04	--	2.3E+04
Paclobutrazol	76738-62-0	--	--	--	--	1.5E+04	2.8E+04	--	9.9E+03
Paraquat	4685-14-7	--	--	--	--	5.3E+03	9.8E+03	--	3.4E+03
Parathion	56-38-2	--	--	--	--	7.0E+03	1.3E+04	--	4.6E+03
Pebulate	1114-71-2	--	--	--	--	5.8E+04	--	--	5.8E+04
Pendimethalin	40487-42-1	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
Pentabromo-6-chloro cyclohexane	87-84-3	1.6E+03	3.0E+03	--	1.1E+03	2.3E+04	4.3E+04	--	1.5E+04
Pentabromodiphenyl ether	32534-81-9	--	--	--	--	2.3E+03	--	--	2.3E+03
Pentachlorobenzene	608-93-5	--	--	--	--	9.3E+02	--	--	9.3E+02
Pentachloronitrobenzene	82-68-8	1.3E+02	--	--	1.3E+02	3.5E+03	--	--	3.5E+03
Pentachlorophenol	87-86-5	8.2E+01	6.1E+01	4.8E+07	3.5E+01	5.8E+03	4.3E+03	--	2.5E+03
Perchlorate	14797-73-0	--	--	--	--	8.2E+02	--	--	8.2E+02
Perfluoroalkyl Compounds	**0.0E+00**								
Perfluoro-octanesulfonate (PFOS)^^	1763-23-1	--	--	--	--	2.3E+02	4.3E+02	--	1.5E+02
Perfluorooctanoic acid (PFOA)^^	335-67-1	4.7E+02	8.7E+02	--	3.0E+02	2.3E+01	4.3E+01	--	1.5E+01
Permethrin	52645-53-1	--	--	--	--	5.8E+04	1.1E+05	--	3.8E+04
Phenmedipham	13684-63-4	--	--	--	--	2.8E+05	5.2E+05	--	1.8E+05
Phenol	108-95-2	--	--	--	--	3.5E+05	6.5E+05	1.7E+09	2.3E+05
m-Phenylenediamine	108-45-2	--	--	--	--	7.0E+03	1.3E+04	--	4.6E+03
p-Phenylenediamine	106-50-3	--	--	--	--	1.2E+03	2.2E+03	--	7.6E+02
Phenylmercuric acetate	62-38-4	--	--	--	--	9.3E+01	1.7E+02	--	6.1E+01
2-Phenylphenol	90-43-7	1.7E+04	3.2E+04	--	1.1E+04	--	--	--	--
Phorate	298-02-2	--	--	--	--	2.3E+02	4.3E+02	--	1.5E+02
Phosmet	732-11-6	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
Phosphine	7803-51-2	--	--	--	--	3.5E+02	--	2.6E+06	3.5E+02
Phosphoric acid	7664-38-2	--	--	--	--	5.7E+07	--	8.7E+07	3.5E+07
Phosphorus (white)	7723-14-0	--	--	--	--	2.3E+01	--	--	2.3E+01
p-Phthalic acid	100-21-0	--	--	--	--	1.2E+06	2.2E+06	--	7.6E+05
Phthalic anhydride	85-44-9	--	--	--	--	2.3E+06	4.3E+06	1.7E+08	1.5E+06
Picloram	1918-02-1	--	--	--	--	8.2E+04	1.5E+05	--	5.3E+04

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	INDUSTRIAL SOIL							
		Cancer Risk = 1E-05				Chronic HQ = 1			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Pirimiphos-methyl	29232-93-7	--	--	--	--	8.2E+01	1.5E+02	--	5.3E+01
Polybrominated biphenyls (PBBs)	59536-65-1	1.1E+00	2.0E+00	2.8E+04	7.1E-01	8.2E+00	1.5E+01	--	5.3E+00
Polychlorinated biphenyls (PCBs)	1336-36-3	1.6E+01	2.2E+01	1.1E+02	8.6E+00	--	--	--	--
Aroclor 1016	12674-11-2	4.7E+02	--	1.2E+07	4.7E+02	8.2E+01	--	--	8.2E+01
Aroclor 1221	11104-28-2	1.6E+01	2.2E+01	4.4E+01	7.7E+00	--	--	--	--
Aroclor 1232	11141-16-5	1.6E+01	2.2E+01	2.4E+01	6.7E+00	--	--	--	--
Aroclor 1242	53469-21-9	1.6E+01	2.2E+01	1.3E+02	8.7E+00	--	--	--	--
Aroclor 1248	12672-29-6	1.6E+01	2.2E+01	1.3E+02	8.7E+00	--	--	--	--
Aroclor 1254	11097-69-1	1.6E+01	2.2E+01	1.8E+02	8.9E+00	2.3E+01	3.1E+01	--	1.3E+01
Aroclor 1260	11096-82-5	1.6E+01	2.2E+01	2.8E+02	9.0E+00	--	--	--	--
Polynuclear aromatic hydrocarbons (PAHs)	0.0E+00								
Acenaphthene	83-32-9	--	--	--	--	7.0E+04	1.0E+05	--	4.1E+04
Anthracene									
Benz[a]anthracene	56-55-3	3.3E+02	4.7E+02	9.0E+03	1.9E+02	--	--	--	--
Benzo[a]pyrene	50-32-8	3.3E+01	4.7E+01	4.1E+05	1.9E+01	3.5E+02	5.0E+02	1.7E+04	2.0E+02
Benzo[b]fluoranthene	205-99-2								
Benzo[k]fluoranthene	207-08-9	3.3E+03	4.7E+03	4.1E+07	1.9E+03	--	--	--	--
Chrysene	218-01-9	3.3E+04	4.7E+04	4.1E+08	1.9E+04	--	--	--	--
Dibenz[ah]anthracene	53-70-3	3.3E+01	4.7E+01	4.1E+05	1.9E+01	--	--	--	--
Fluoranthene	206-44-0	--	--	--	--	4.7E+04	6.7E+04	--	2.7E+04
Fluorene	86-73-7	--	--	--	--	4.7E+04	6.7E+04	--	2.7E+04
Indeno[1,2,3-cd]pyrene	193-39-5	3.3E+02	4.7E+02	4.1E+06	1.9E+02	--	--	--	--
Naphthalene	91-20-3	--	--	1.7E+02	1.7E+02	2.3E+04	3.3E+04	6.1E+02	5.8E+02
Pyrene	129-00-0								
Prochloraz	67747-09-5	2.2E+02	4.1E+02	--	1.4E+02	1.1E+04	2.0E+04	--	6.8E+03
Profluralin	26399-36-0	--	--	--	--	7.0E+03	--	--	7.0E+03
Prometon	1610-18-0	--	--	--	--	1.8E+04	3.3E+04	--	1.1E+04
Prometryn	7287-19-6	--	--	--	--	4.7E+04	8.7E+04	--	3.0E+04
Propyzamide (Pronamide)	23950-58-5	--	--	--	--	8.8E+04	1.6E+05	--	5.7E+04
Propachlor	1918-16-7	--	--	--	--	1.5E+04	2.8E+04	--	9.9E+03
Propanil	709-98-8	--	--	--	--	5.8E+03	1.1E+04	--	3.8E+03
Propargite	2312-35-8	1.7E+02	3.2E+02	--	1.1E+02	4.7E+04	8.7E+04	--	3.0E+04
Propargyl alcohol	107-19-7	--	--	--	--	2.3E+03	--	--	2.3E+03
Propazine	139-40-2	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
Propham	122-42-9	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
Propiconazole	60207-90-1	--	--	--	--	1.2E+05	2.2E+05	--	7.6E+04
n-Propylbenzene	103-65-1	--	--	--	--	1.2E+05	--	3.1E+04	2.4E+04
Propylene glycol	57-55-6	--	--	--	--	2.3E+07	4.3E+07	--	1.5E+07
Propylene glycol, monoethyl ether	52125-53-8	--	--	--	--	8.2E+05	--	6.9E+05	3.7E+05
Propylene glycol, monomethyl ether	107-98-2	--	--	--	--	8.2E+05	--	6.9E+05	3.7E+05
Propylene oxide	75-56-9	1.4E+02	--	2.6E+03	1.3E+02	--	--	1.0E+04	1.0E+04
Pyridine	110-86-1	--	--	--	--	1.2E+03	--	--	1.2E+03
Quinalphos	13593-03-8	--	--	--	--	5.8E+02	1.1E+03	--	3.8E+02
Quinoline	91-22-5	1.1E+01	2.0E+01	--	7.1E+00	--	--	--	--
Resmethrin	10453-86-8	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
Ronnel	299-84-3	--	--	--	--	5.8E+04	--	--	5.8E+04
Rotenone	83-79-4	--	--	--	--	4.7E+03	8.7E+03	--	3.0E+03
Selenious Acid	7783-00-8	--	--	--	--	5.8E+03	--	--	5.8E+03
Selenium	7782-49-2	--	--	--	--	5.8E+03	--	1.7E+08	5.8E+03
Sethoxydim	74051-80-2	--	--	--	--	1.6E+05	3.0E+05	--	1.1E+05
Silver and compounds	7440-22-4	--	--	--	--	5.8E+03	--	--	5.8E+03
Simazine	122-34-9	2.7E+02	5.1E+02	--	1.8E+02	5.8E+03	1.1E+04	--	3.8E+03
Sodium azide	26628-22-8	--	--	--	--	4.7E+03	--	--	4.7E+03
Sodium diethyldithiocarbamate	148-18-5	1.2E+02	2.3E+02	--	7.9E+01	3.5E+04	6.5E+04	--	2.3E+04
Sodium fluoroacetate	62-74-8	--	--	--	--	2.3E+01	4.3E+01	--	1.5E+01
Sodium metavanadate	13718-26-8	--	--	--	--	1.2E+03	--	--	1.2E+03
Strontium, stable	7440-24-6	--	--	--	--	7.0E+05	--	--	7.0E+05
Strychnine	57-24-9	--	--	--	--	3.5E+02	6.5E+02	--	2.3E+02
Styrene	100-42-5	--	--	--	--	2.3E+05	--	4.1E+04	3.5E+04
1,1'-Sulfonylbis (4-Chlorobenzene)	80-07-9	--	--	--	--	9.3E+02	1.7E+03	--	6.1E+02
Tebuthiuron	34014-18-1	--	--	--	--	8.2E+04	1.5E+05	--	5.3E+04

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	INDUSTRIAL SOIL							
		Cancer Risk = 1E-05				Chronic HQ = 1			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Temephos	3383-96-8	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
Terbacil	5902-51-2	--	--	--	--	1.5E+04	2.8E+04	--	9.9E+03
Terbufos	13071-79-9	--	--	--	--	2.9E+01	--	--	2.9E+01
Terbutryn	886-50-0	--	--	--	--	1.2E+03	2.2E+03	--	7.6E+02
1,2,4,5-Tetrachlorobenzene	95-94-3	--	--	--	--	3.5E+02	--	--	3.5E+02
2,3,7,8-Tetrachlorodibenzo-p-dioxin (Dioxin)	1746-01-6	2.5E-04	1.6E-03	6.3E-03	2.1E-04	8.2E-04	5.1E-03	3.4E-01	7.0E-04
1,1,1,2-Tetrachloroethane	630-20-6	1.3E+03	--	9.4E+01	8.8E+01	3.5E+04	--	--	3.5E+04
1,1,2,2-Tetrachloroethane	79-34-5	1.6E+02	--	3.2E+01	2.7E+01	2.3E+04	--	--	2.3E+04
Tetrachloroethylene (PCE)	127-18-4	1.6E+04	--	1.1E+03	1.0E+03	7.0E+03	--	4.1E+02	3.9E+02
2,3,4,6-Tetrachlorophenol	58-90-2	--	--	--	--	3.5E+04	6.5E+04	--	2.3E+04
p,a,a,a-Tetrachlorotoluene	5216-25-1	1.6E+00	--	--	1.6E+00	--	--	--	--
Tetrachlorovinphos (Stirofos)	961-11-5	1.4E+03	2.5E+03	--	8.9E+02	3.5E+04	6.5E+04	--	2.3E+04
Tetraethyldithiopyrophosphate	3689-24-5	--	--	--	--	5.8E+02	1.1E+03	--	3.8E+02
Thallium and compounds	7440-28-0	--	--	--	--	1.2E+01	--	--	1.2E+01
Thiobencarb	28249-77-6	--	--	--	--	1.2E+04	2.2E+04	--	7.6E+03
Thiofanox	39196-18-4	--	--	--	--	3.5E+02	6.5E+02	--	2.3E+02
Thiophanate-methyl	23564-05-8	2.7E+03	5.1E+03	--	1.8E+03	3.2E+04	5.9E+04	--	2.1E+04
Thiram	137-26-8	--	--	--	--	1.8E+04	3.3E+04	--	1.1E+04
Tin and compounds	7440-31-5	--	--	--	--	7.0E+05	--	--	7.0E+05
Toluene	108-88-3	--	--	--	--	9.3E+04	--	9.4E+04	4.7E+04
p-Toluidine	106-49-0	1.1E+03	2.0E+03	--	7.1E+02	4.7E+03	8.7E+03	--	3.0E+03
Tralomethrin	66841-25-6	--	--	--	--	8.8E+03	1.6E+04	--	5.7E+03
Triadimefon (Bayleton)	43121-43-3	--	--	--	--	4.0E+04	7.4E+04	--	2.6E+04
Triallate	2303-17-5	4.5E+02	--	--	4.5E+02	2.9E+04	--	--	2.9E+04
Triasulfuron	82097-50-5	--	--	--	--	1.2E+04	2.2E+04	--	7.6E+03
Tribenuron-methyl (Express)	101200-48-0	--	--	--	--	9.3E+03	1.7E+04	--	6.1E+03
1,2,4-Tribromobenzene	615-54-3	--	--	--	--	5.8E+03	--	--	5.8E+03
Tributyltin oxide (TBTO)	56-35-9	--	--	--	--	3.5E+02	6.5E+02	--	2.3E+02
2,4,6-Trichloroaniline	634-93-5	4.7E+03	8.7E+03	--	3.0E+03	3.5E+01	6.5E+01	--	2.3E+01
2,4,6-Trichloroaniline hydrochloride	33663-50-2	1.1E+03	2.1E+03	--	7.3E+02	--	--	--	--
1,2,4-Trichlorobenzene	120-82-1	1.1E+03	--	--	1.1E+03	1.2E+04	--	2.6E+02	2.6E+02
1,1,1-Trichloroethane	71-55-6	--	--	--	--	2.3E+06	--	3.6E+04	3.6E+04
1,1,2-Trichloroethane	79-00-5	5.7E+02	--	5.5E+01	5.0E+01	4.7E+03	--	6.3E+00	6.3E+00
Trichloroethylene (TCE) Long-term +++	79-01-6	7.1E+02	--	6.6E+01	6.0E+01	5.8E+02	--	1.9E+01	1.9E+01
Trichloroethylene (TCE) Short-term ‡	79-01-6	--	--	--	--	--	--	--	--
Trichlorofluoromethane	75-69-4	--	--	--	--	3.5E+05	--	--	3.5E+05
2,4,5-Trichlorophenol	95-95-4	--	--	--	--	1.2E+05	2.2E+05	--	7.6E+04
2,4,6-Trichlorophenol	88-06-2	3.0E+03	5.5E+03	7.9E+07	1.9E+03	1.2E+03	2.2E+03	--	7.6E+02
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	--	--	--	--	1.2E+04	2.2E+04	--	7.6E+03
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	93-72-1	--	--	--	--	9.3E+03	1.7E+04	--	6.1E+03
1,1,2-Trichloropropane	598-77-6	--	--	--	--	5.8E+03	--	--	5.8E+03
1,2,3-Trichloropropane	96-18-4	1.1E+00	--	--	1.1E+00	4.7E+03	--	2.1E+01	2.1E+01
1,2,3-Trichloropropene	96-19-5	--	--	--	--	3.5E+03	--	3.1E+00	3.1E+00
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	--	--	--	--	3.5E+07	--	2.8E+04	2.8E+04
Tridiphane	58138-08-2	--	--	--	--	3.5E+03	6.5E+03	--	2.3E+03
Triethylamine	121-44-8	--	--	--	--	--	--	4.8E+02	4.8E+02
Trifluralin	1582-09-8	4.2E+03	--	--	4.2E+03	8.8E+03	--	--	8.8E+03
1,2,4-Trimethylbenzene	95-63-6	--	--	--	--	1.2E+04	--	2.1E+03	1.8E+03
1,3,5-Trimethylbenzene	108-67-8	--	--	--	--	1.2E+04	--	1.7E+03	1.5E+03
Trimethyl phosphate	512-56-1	1.6E+03	3.0E+03	--	1.1E+03	1.2E+04	2.2E+04	--	7.6E+03
1,3,5-Trinitrobenzene	99-35-4	--	--	--	--	3.5E+04	3.4E+05	--	3.2E+04
Trinitrophenylmethylnitramine (Tetryl)	479-45-8	--	--	--	--	2.3E+03	6.7E+05	--	2.3E+03
2,4,6-Trinitrotoluene (TNT)	118-96-7	1.1E+03	6.3E+03	--	9.3E+02	5.8E+02	3.4E+03	--	5.0E+02
Triphenylphosphine oxide	791-28-6	--	--	--	--	2.3E+04	4.3E+04	--	1.5E+04
Tris(2-chloroethyl) phosphate	115-96-8	1.6E+03	3.0E+03	--	1.1E+03	8.2E+03	1.5E+04	--	5.3E+03
Uranium (chemical toxicity only)	7440-61-0	--	--	--	--	2.3E+02	--	3.5E+05	2.3E+02
Vanadium and compounds +++	7440-62-2	--	--	--	--	5.8E+03	--	8.7E+05	5.8E+03
Vernolate (Vernam)	1929-77-7	--	--	--	--	1.2E+03	--	--	1.2E+03
Vinclozolin	50471-44-8	--	--	--	--	1.4E+03	2.6E+03	--	9.1E+02
Vinyl acetate	108-05-4	--	--	--	--	1.2E+06	--	3.9E+03	3.8E+03
Vinyl bromide	593-60-2	--	--	5.2E+00	5.2E+00	--	--	1.8E+01	1.8E+01

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-4: SOIL REMEDIAL GOALS

CONTAMINANT	CAS No.	INDUSTRIAL SOIL							
		Cancer Risk = 1E-05				Chronic HQ = 1			
		soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)	soil-ingest (mg/kg)	soil-dermal (mg/kg)	soil-inhale (mg/kg)	combined (mg/kg)
Vinyl chloride +++	75-01-4	4.5E+01	--	2.7E+01	1.7E+01	3.5E+03	--	4.2E+02	3.7E+02
Warfarin	81-81-2	--	--	--	--	3.5E+02	6.5E+02	--	2.3E+02
Xylenes	1330-20-7	--	--	--	--	2.3E+05	--	2.5E+03	2.5E+03
Zinc	7440-66-6	--	--	--	--	3.5E+05	--	--	3.5E+05
Zinc phosphide	1314-84-7	--	--	--	--	3.5E+02	--	--	3.5E+02
Zineb	12122-67-7	--	--	--	--	5.8E+04	1.1E+05	--	3.8E+04

Notes:

* At VCP sites where chromium is a potential contaminant of concern, such as a former metal plating facility, the VCP applicant should collect media samples for both Chromium III and Chromium VI analyses.

+++ See Section 5.4 of Appendix A, Protocol for VCP Remediation Goal Lookup Tables, Nebraska Voluntary Cleanup Program for more information.

HQ = hazard quotient
mg/kg = milligram per kilogram
soil-dermal = soil dermal pathway
soil-ingest = soil ingestion pathway
soil-inhale = soil inhalation pathway

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-5: SUBSLAB AND EXTERIOR SOIL GAS and GROUNDWATER TO INDOOR AIR REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
Acephate	30560-19-1	--	--	--	--	--	--	--	--
Acetaldehyde	75-07-0	1.3E+00	2.3E+00	4.3E+01	7.9E+02	5.6E+01	3.9E+01	1.3E+03	2.4E+04
Acetochlor	34256-82-1	--	--	--	--	--	--	--	--
Acetone	67-64-1	--	8.1E+03	2.7E+05	1.1E+07	--	1.4E+05	4.5E+06	1.8E+08
Acetone cyanohydrin	75-86-5	--	5.2E-01	--	--	--	8.8E+00	--	--
Acetonitrile	75-05-8	--	1.6E+01	5.2E+02	2.1E+04	--	2.6E+02	8.8E+03	3.5E+05
Acrolein	107-02-8	--	5.2E-03	1.7E-01	1.9E+00	--	8.8E-02	2.9E+00	3.2E+01
Acrylamide	79-06-1	1.0E-02	1.6E+00	--	--	1.2E+00	2.6E+01	--	--
Acrylic acid	79-10-7	--	2.6E-01	8.7E+00	5.2E+04	--	4.4E+00	1.5E+02	8.8E+05
Acrylonitrile	107-13-1	4.1E-02	5.2E-01	1.4E+00	1.5E+01	1.8E+00	8.8E+00	6.0E+01	6.7E+02
Alachlor	15972-60-8	--	--	--	--	--	--	--	--
Aldicarb	116-06-3	--	--	--	--	--	--	--	--
Aldicarb sulfone	1646-88-4	--	--	--	--	--	--	--	--
Aldrin	309-00-2	5.7E-04	--	1.9E-02	1.4E+00	2.5E-02	--	8.3E-01	NVT
Allyl alcohol	107-18-6	--	2.6E-02	8.7E-01	3.3E+02	--	4.4E-01	1.5E+01	5.5E+03
Allyl chloride	107-05-1	4.7E-01	2.6E-01	8.7E+00	1.1E+00	2.0E+01	4.4E+00	1.5E+02	1.8E+01
Aluminum	7429-90-5	--	1.3E+00	--	--	--	2.2E+01	--	--
Aluminum phosphide	20859-73-8	--	--	--	--	--	--	--	--
Ametryn	834-12-8	--	--	--	--	--	--	--	--
m-Aminophenol	591-27-5	--	--	--	--	--	--	--	--
Amitraz	33089-61-1	--	--	--	--	--	--	--	--
Ammonia +++	7664-41-7	--	1.3E+02	4.3E+03	3.0E+05	--	2.2E+03	7.3E+04	5.1E+06
Ammonium sulfamate	7773-06-0	--	--	--	--	--	--	--	--
Aniline	62-53-3	1.8E+00	2.6E-01	--	--	7.7E+01	4.4E+00	--	--
Antimony and compounds	7440-36-0	--	--	--	--	--	--	--	--
Antimony pentoxide	1314-60-9	--	--	--	--	--	--	--	--
Antimony potassium tartrate	28300-74-5	--	--	--	--	--	--	--	--
Antimony tetroxide	1332-81-6	--	--	--	--	--	--	--	--
Antimony trioxide	1309-64-4	--	5.2E-02	--	--	--	8.8E-01	--	--
Arsenic (inorganic) +++	7440-38-2	--	--	--	--	--	--	--	--
Arsine	7784-42-1	--	1.3E-02	--	--	--	2.2E-01	--	--
Assure	76578-14-8	--	--	--	--	--	--	--	--
Asulam	3337-71-1	--	--	--	--	--	--	--	--
Atrazine	1912-24-9	--	--	--	--	--	--	--	--
Avermectin B1	65195-55-3	--	--	--	--	--	--	--	--
Azobenzene	103-33-3	9.1E-02	--	3.0E+00	1.6E+02	4.0E+00	--	1.3E+02	NVT
Barium and compounds	7440-39-3	--	1.3E-01	--	--	--	2.2E+00	--	--
Benfluralin (Benefin)	1861-40-1	--	--	--	--	--	--	--	--
Bensulfuron-methyl (Londax)	83055-99-6	--	--	--	--	--	--	--	--
Bentazone (Bentazon)	25057-89-0	--	--	--	--	--	--	--	--
Benzaldehyde	100-52-7	--	--	--	--	--	--	--	--
Benzene	71-43-2	3.6E-01	7.8E+00	1.2E+01	3.1E+00	1.6E+01	1.3E+02	5.2E+02	1.4E+02
Benzidine	92-87-5	1.5E-05	--	--	--	1.8E-03	--	--	--
Benzoic acid	65-85-0	--	--	--	--	--	--	--	--
Benzotrichloride	98-07-7	--	--	--	--	--	--	--	--
Benzyl alcohol	100-51-6	--	--	--	--	--	--	--	--
Benzyl chloride	100-44-7	5.7E-02	2.6E-01	1.9E+00	8.3E+00	2.5E+00	4.4E+00	8.3E+01	3.6E+02

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-5: SUBSLAB AND EXTERIOR SOIL GAS and GROUNDWATER TO INDOOR AIR REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
Beryllium and compounds	7440-41-7	1.2E-03	5.2E-03	--	--	5.1E-02	8.8E-02	--	--
Biphenthrin (Talstar)	82657-04-3	--	--	--	--	--	--	--	--
1,1-Biphenyl	92-52-4	--	1.0E-01	3.5E+00	2.7E+01	--	1.8E+00	5.8E+01	4.5E+02
Bis(2-chloroethyl)ether	111-44-4	8.5E-03	--	2.8E-01	3.8E+01	3.7E-01	--	1.2E+01	1.7E+03
Bis(chloromethyl)ether	542-88-1	4.5E-05	--	1.5E-03	2.5E-04	2.0E-03	--	6.6E-02	1.1E-02
Bis(2-chloro-1-methylethyl)ether	108-60-1	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	1.2E+00	--	--	--	5.1E+01	--	--	--
Bisphenol A	80-05-7	--	--	--	--	--	--	--	--
Boron	7440-42-8	--	5.2E+00	--	--	--	8.8E+01	--	--
Boron trifluoride	7637-07-2	--	3.4E+00	1.1E+02	No HLC	--	5.7E+01	1.9E+03	No HLC
Bromate	15541-45-4	--	--	--	--	--	--	--	--
Bromobenzene	108-86-1	--	1.6E+01	5.2E+02	4.4E+02	--	2.6E+02	8.8E+03	7.4E+03
Bromodichloromethane	75-27-4	7.6E-02	--	2.5E+00	1.8E+00	3.3E+00	--	1.1E+02	7.9E+01
Bromoform (Tribromomethane)	75-25-2	2.6E+00	--	8.5E+01	3.0E+02	1.1E+02	--	3.7E+03	1.3E+04
Bromomethane	74-83-9	--	1.3E+00	4.3E+01	6.9E+00	--	2.2E+01	7.3E+02	1.2E+02
Bromophos	2104-96-3	--	--	--	--	--	--	--	--
Bromoxynil	1689-84-5	--	--	--	--	--	--	--	--
Bromoxynil octanoate	1689-99-2	--	--	--	--	--	--	--	--
1,3-Butadiene	106-99-0	9.4E-02	5.2E-01	3.1E+00	--	4.1E+00	8.8E+00	1.4E+02	--
1-Butanol	71-36-3	--	--	--	--	--	--	--	--
Butylate	2008-41-5	--	--	--	--	--	--	--	--
Butyl benzyl phthalate	85-68-7	--	--	--	--	--	--	--	--
Butylphthalyl butylglycolate	85-70-1	--	--	--	--	--	--	--	--
Cacodylic acid	75-60-5	--	--	--	--	--	--	--	--
Cadmium and compounds +++	7440-43-9	1.6E-03	2.6E-03	--	--	6.8E-02	4.4E-02	--	--
Camphechlor (Toxaphene)	8001-35-2	8.8E-03	--	--	--	3.8E-01	--	--	--
Caprolactam	105-60-2	--	5.7E-01	--	--	--	9.6E+00	--	--
Captafol	2425-06-1	6.5E-02	--	--	--	2.9E+00	--	--	--
Captan	133-06-2	4.3E+00	--	--	--	1.9E+02	--	--	--
Carbaryl	63-25-2	--	--	--	--	--	--	--	--
Carbofuran	1563-66-2	--	--	--	--	--	--	--	--
Carbon disulfide	75-15-0	--	1.8E+02	6.1E+03	5.4E+02	--	3.1E+03	1.0E+05	9.1E+03
Carbon tetrachloride	56-23-5	4.7E-01	2.6E+01	1.6E+01	8.0E-01	2.0E+01	4.4E+02	6.8E+02	3.5E+01
Carbosulfan	55285-14-8	--	--	--	--	--	--	--	--
Carboxin	5234-68-4	--	--	--	--	--	--	--	--
Chloramben	133-90-4	--	--	--	--	--	--	--	--
Chloranil	118-75-2	--	--	--	--	--	--	--	--
Chlordane	12789-03-6	2.8E-02	1.8E-01	9.4E-01	NVT	1.2E+00	3.1E+00	4.1E+01	NVT
Chlordecone (Kepone)	143-50-0	6.1E-04	--	--	--	2.7E-02	--	--	--
Chlorimuron-ethyl	90982-32-4	--	--	--	--	--	--	--	--
Chlorine	7782-50-5	--	3.9E-02	1.3E+00	1.5E+01	--	6.6E-01	2.2E+01	2.5E+02
Chlorine dioxide	10049-04-4	--	5.2E-02	1.7E+00	No S	--	8.8E-01	2.9E+01	No S
Chloroacetic acid	79-11-8	--	--	--	--	--	--	--	--
2-Chloroacetophenone	532-27-4	--	7.8E-03	--	--	--	1.3E-01	--	--
4-Chloroaniline	106-47-8	--	--	--	--	--	--	--	--
Chlorobenzene	108-90-7	--	1.3E+01	4.3E+02	2.3E+02	--	2.2E+02	7.3E+03	3.9E+03
Chlorobenzilate	510-15-6	9.1E-02	--	--	--	4.0E+00	--	--	--

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-5: SUBSLAB AND EXTERIOR SOIL GAS and GROUNDWATER TO INDOOR AIR REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
p-Chlorobenzoic acid	74-11-3	--	--	--	--	--	--	--	--
4-Chlorobenzotrifluoride	98-56-6	--	7.8E+01	2.6E+03	--	--	1.3E+03	4.4E+04	--
2-Chloro-1,3-butadiene	126-99-8	9.4E-03	5.2E+00	3.1E-01	8.4E-03	4.1E-01	8.8E+01	1.4E+01	3.7E-01
1-Chlorobutane	109-69-3	--	--	--	--	--	--	--	--
1-Chloro-1,1-difluoroethane	75-68-3	--	1.3E+04	4.3E+05	3.6E+05	--	2.2E+05	7.3E+06	NVT
Chlorodifluoromethane	75-45-6	--	1.3E+04	4.3E+05	1.1E+04	--	2.2E+05	7.3E+06	1.9E+05
2-Chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester sulfurous acid (Aramite)	140-57-8	4.0E-01	--	--	--	1.7E+01	--	--	--
Chloroform	67-66-3	1.2E-01	2.6E+01	4.1E+00	1.5E+00	5.3E+00	4.3E+02	1.8E+02	6.7E+01
Chloromethane	74-87-3	--	2.3E+01	7.8E+02	9.7E+01	--	3.9E+02	1.3E+04	1.6E+03
4-Chloro-2-methylaniline hydrochloride	3165-93-3	--	--	--	--	--	--	--	--
beta-Chloronaphthalene	91-58-7	--	--	--	--	--	--	--	--
o-Chloronitrobenzene	88-73-3	--	2.6E-03	--	--	--	4.4E-02	--	--
p-Chloronitrobenzene	100-00-5	--	5.2E-01	--	--	--	8.8E+00	--	--
2-Chlorophenol	95-57-8	--	--	--	--	--	--	--	--
Chlorothalonil	1897-45-6	3.2E+00	--	--	--	1.4E+02	--	--	--
o-Chlorotoluene	95-49-8	--	--	--	--	--	--	--	--
Chlorpropham	101-21-3	--	--	--	--	--	--	--	--
Chlorpyrifos	2921-88-2	--	--	--	--	--	--	--	--
Chlorpyrifos-methyl	5598-13-0	--	--	--	--	--	--	--	--
Chlorsulfuron	64902-72-3	--	--	--	--	--	--	--	--
Chlorthiophos	60238-56-4	--	--	--	--	--	--	--	--
Chromium, Total	7440-47-3	--	--	--	--	--	--	--	--
Chromium III *	16065-83-1	--	--	--	--	--	--	--	--
Chromium VI +++	18540-29-9	1.2E-05	2.6E-02	--	--	1.5E-03	4.4E-01	--	--
Clofentezine (Apollo)	74115-24-5	--	--	--	--	--	--	--	--
Cobalt	7440-48-4	3.1E-04	1.6E-03	--	--	1.4E-02	2.6E-02	--	--
Coke Oven Emissions	8007-45-2	1.6E-03	--	No MW	No MW	2.0E-01	--	No MW	No MW
Copper and compounds	7440-50-8	--	--	--	--	--	--	--	--
Crotonaldehyde	123-73-9	--	--	--	--	--	--	--	--
Cumene (Isopropylbenzene)	98-82-8	--	1.0E+02	3.5E+03	6.3E+02	--	1.8E+03	5.8E+04	1.1E+04
Cyanazine	21725-46-2	--	--	--	--	--	--	--	--
Cyanide (free)	57-12-5	--	2.1E-01	7.0E+00	5.0E+01	--	3.5E+00	1.2E+02	8.4E+02
Cyanide (hydrogen)	74-90-8	--	2.1E-01	7.0E+00	6.8E+01	--	3.5E+00	1.2E+02	1.1E+03
Cyanogen	460-19-5	--	--	--	--	--	--	--	--
Cyanogen bromide	506-68-3	--	--	--	--	--	--	--	--
Cyanogen chloride	506-77-4	--	--	--	--	--	--	--	--
Cyclohexane	110-82-7	--	1.6E+03	5.2E+04	4.9E+02	--	2.6E+04	8.8E+05	8.3E+03
Cyclohexanone	108-94-1	--	1.8E+02	6.1E+03	1.5E+06	--	3.1E+03	1.0E+05	NVT
Cyclohexylamine	108-91-8	--	--	--	--	--	--	--	--
Cyfluthrin (Baythroid)	68359-37-5	--	--	--	--	--	--	--	--
Cyhalothrin (Karate)	68085-85-8	--	--	--	--	--	--	--	--
Cyromazine	66215-27-8	--	--	--	--	--	--	--	--
Dacthal	1861-32-1	--	--	--	--	--	--	--	--
Dalapon	75-99-0	--	--	--	--	--	--	--	--
Daminozide (Alar)	1596-84-5	5.5E-01	--	--	--	2.4E+01	--	--	--
Demeton	8065-48-3	--	--	--	--	--	--	--	--
Diallate	2303-16-4	--	--	--	--	--	--	--	--

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
Diazinon	333-41-5	--	--	--	--	--	--	--	--
Dibenzofuran	132-64-9	--	--	--	--	--	--	--	--
1,4-Dibromobenzene	106-37-6	--	--	--	--	--	--	--	--
Dibromochloromethane	124-48-1	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	96-12-8	1.7E-04	5.2E-02	5.6E-03	7.9E-02	2.0E-02	8.8E-01	6.8E-01	9.6E+00
1,2-Dibromoethane	106-93-4	4.7E-03	2.3E+00	1.6E-01	4.1E-01	2.0E-01	3.9E+01	6.8E+00	1.8E+01
Dibutyl phthalate	84-74-2	--	--	--	--	--	--	--	--
Dicamba	1918-00-9	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	95-50-1	--	5.2E+01	1.7E+03	1.8E+03	--	8.8E+02	2.9E+04	2.9E+04
1,4-Dichlorobenzene	106-46-7	2.6E-01	2.1E+02	8.5E+00	6.6E+00	1.1E+01	3.5E+03	3.7E+02	2.9E+02
3,3-Dichlorobenzidine	91-94-1	8.3E-03	--	--	--	3.6E-01	--	--	--
4,4'-Dichlorobenzophenone	90-98-2	--	--	--	--	--	--	--	--
1,4-Dichloro-2-butene	764-41-0	6.7E-04	--	2.2E-02	1.9E-03	2.9E-02	--	9.7E-01	8.4E-02
Dichlorodifluoromethane	75-71-8	--	2.6E+01	8.7E+02	3.7E+00	--	4.4E+02	1.5E+04	6.3E+01
p,p'-Dichlorodiphenyldichloroethane (DDD)	72-54-8	4.1E-02	--	--	--	1.8E+00	--	--	--
p,p'-Dichlorodiphenyldichloroethylene (DDE)	72-55-9	2.9E-02	--	9.6E-01	NVT	1.3E+00	--	4.2E+01	NVT
p,p'-Dichlorodiphenyltrichloroethane (DDT)	50-29-3	2.9E-02	--	--	--	1.3E+00	--	--	--
1,1-Dichloroethane	75-34-3	1.8E+00	--	5.8E+01	1.4E+01	7.7E+01	--	2.6E+03	6.2E+02
1,2-Dichloroethane	107-06-2	1.1E-01	1.8E+00	3.6E+00	4.5E+00	4.7E+00	3.1E+01	1.6E+02	2.0E+02
1,1-Dichloroethylene	75-35-4	--	5.2E+01	1.7E+03	8.3E+01	--	8.8E+02	2.9E+04	1.4E+03
1,2-Dichloroethylene (cis)	156-59-2	--	--	--	--	--	--	--	--
1,2-Dichloroethylene (trans)	156-60-5	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	120-83-2	--	--	--	--	--	--	--	--
2,4-Dichlorophenoxy acetic acid (2,4-D)	94-75-7	--	--	--	--	--	--	--	--
2,4-Dichlorophenoxy butyric acid (2,4-DB)	94-82-6	--	--	--	--	--	--	--	--
Decabromodiphenyl ether (BDE-209)	1163-19-5	--	--	--	--	--	--	--	--
1,2-Dichloropropane	78-87-5	7.5E-01	1.0E+00	2.5E+01	1.3E+01	3.3E+01	1.8E+01	5.8E+02	3.1E+02
2,3-Dichloropropanol	616-23-9	--	--	--	--	--	--	--	--
1,3-Dichloropropene	542-75-6	7.0E-01	5.2E+00	2.3E+01	1.0E+01	3.1E+01	8.8E+01	1.0E+03	4.5E+02
Dichlorvos	62-73-7	3.4E-02	1.3E-01	--	--	1.5E+00	2.2E+00	--	--
Dicrotophos (Bidrin)	141-66-2	--	--	--	--	--	--	--	--
Dicyclopentadiene	77-73-6	--	7.8E-02	2.6E+00	3.8E-02	--	1.3E+00	4.4E+01	6.4E-01
Dieldrin	60-57-1	6.1E-04	--	--	--	2.7E-02	--	--	--
Diethylene glycol, monobutyl ether	112-34-5	--	2.6E-02	--	--	--	4.4E-01	--	--
Diethylene glycol, monoethyl ether	111-90-0	--	7.8E-02	--	--	--	1.3E+00	--	--
Diethylformamide	617-84-5	--	--	--	--	--	--	--	--
Di(2-ethylhexyl)adipate	103-23-1	--	--	--	--	--	--	--	--
Diethyl phthalate	84-66-2	--	--	--	--	--	--	--	--
Diethylstilbestrol	56-53-1	2.8E-05	--	--	--	1.2E-03	--	--	--
Difenzoquat (Avenge)	43222-48-6	--	--	--	--	--	--	--	--
Diflubenzuron	35367-38-5	--	--	--	--	--	--	--	--
1,1-Difluoroethane	75-37-6	--	1.0E+04	3.5E+05	1.8E+04	--	1.8E+05	5.8E+06	3.1E+05
Diisopropyl methylphosphonate (DIMP)	1445-75-6	--	--	--	--	--	--	--	--
Dimethipin	55290-64-7	--	--	--	--	--	--	--	--
Dimethoate	60-51-5	--	--	--	--	--	--	--	--
3,3'-Dimethoxybenzidine	119-90-4	--	--	--	--	--	--	--	--
N-N-Dimethylaniline	121-69-7	--	--	--	--	--	--	--	--

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CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
2,4-Dimethylaniline	95-68-1	--	--	--	--	--	--	--	--
2,4-Dimethylaniline hydrochloride	21436-96-4	--	--	--	--	--	--	--	--
3,3'-Dimethylbenzidine	119-93-7	--	--	--	--	--	--	--	--
N,N-Dimethylformamide	68-12-2	--	7.8E+00	2.6E+02	8.1E+06	--	1.3E+02	4.4E+03	1.4E+08
2,4-Dimethylphenol	105-67-9	--	--	--	--	--	--	--	--
2,6-Dimethylphenol	576-26-1	--	--	--	--	--	--	--	--
3,4-Dimethylphenol	95-65-8	--	--	--	--	--	--	--	--
Dimethyl terephthalate	120-61-6	--	--	--	--	--	--	--	--
4,6-Dinitro-o-cyclohexyl phenol	131-89-5	--	--	--	--	--	--	--	--
1,2-Dinitrobenzene	528-29-0	--	--	--	--	--	--	--	--
1,3-Dinitrobenzene	99-65-0	--	--	--	--	--	--	--	--
1,4-Dinitrobenzene	100-25-4	--	--	--	--	--	--	--	--
2,4-Dinitrophenol	51-28-5	--	--	--	--	--	--	--	--
Dinitrotoluene mixture	25321-14-6	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	121-14-2	3.2E-02	--	--	--	1.4E+00	--	--	--
2,6-Dinitrotoluene	606-20-2	--	--	--	--	--	--	--	--
Dinoseb	88-85-7	--	--	--	--	--	--	--	--
1,4-Dioxane	123-91-1	5.6E-01	7.8E+00	1.9E+01	6.5E+03	2.5E+01	1.3E+02	8.2E+02	2.8E+05
Diphenamid	957-51-7	--	--	--	--	--	--	--	--
Diphenylamine	122-39-4	--	--	--	--	--	--	--	--
N,N-Diphenyl-1,4 benzenediamine (DPPD)	74-31-7	--	--	--	--	--	--	--	--
1,2-Diphenylhydrazine	122-66-7	1.3E-02	--	--	--	5.6E-01	--	--	--
Diphenyl sulfone	127-63-9	--	--	--	--	--	--	--	--
Diquat dibromide (Diquat)	85-00-7	--	--	--	--	--	--	--	--
Direct black 38	1937-37-7	2.0E-05	--	--	--	8.8E-04	--	--	--
Direct blue 6	2602-46-2	2.0E-05	--	--	--	8.8E-04	--	--	--
Direct brown 95	16071-86-6	2.0E-05	--	--	--	8.8E-04	--	--	--
Disulfoton	298-04-4	--	--	--	--	--	--	--	--
1,4-Dithiane	505-29-3	--	--	--	--	--	--	--	--
Diuron	330-54-1	--	--	--	--	--	--	--	--
Dodine	2439-10-3	--	--	--	--	--	--	--	--
Endosulfan	115-29-7	--	--	--	--	--	--	--	--
Endothall	145-73-3	--	--	--	--	--	--	--	--
Endrin	72-20-8	--	--	--	--	--	--	--	--
Enilconazole (Imazalil)	35554-44-0	--	--	--	--	--	--	--	--
Epichlorohydrin	106-89-8	2.3E+00	2.6E-01	8.7E+00	2.1E+02	1.0E+02	4.4E+00	1.5E+02	3.5E+03
1,2-Epoxybutane	106-88-7	--	5.2E+00	1.7E+02	1.4E+03	--	8.8E+01	2.9E+03	2.3E+04
S-Ethyl dipropylthiocarbamate (EPTC)	759-94-4	--	--	--	--	--	--	--	--
2-Chloroethyl phosphonic acid (Ethephon)	16672-87-0	--	--	--	--	--	--	--	--
Ethion	563-12-2	--	--	--	--	--	--	--	--
2-Ethoxyethanol	110-80-5	--	5.2E+01	1.7E+03	7.1E+06	--	8.8E+02	2.9E+04	1.2E+08
2-Ethoxyethanol acetate	111-15-9	--	1.6E+01	5.2E+02	3.4E+05	--	2.6E+02	8.8E+03	5.7E+06
Ethyl acetate	141-78-6	--	1.8E+01	6.1E+02	6.8E+03	--	3.1E+02	1.0E+04	1.1E+05
Ethyl acrylate	140-88-5	--	2.1E+00	7.0E+01	3.7E+02	--	3.5E+01	1.2E+03	6.2E+03
Ethylbenzene	100-41-4	1.1E+00	2.6E+02	3.7E+01	8.1E+00	4.9E+01	4.4E+03	1.6E+03	3.5E+02
Ethyl chloride (Chloroethane)	75-00-3	--	2.6E+03	8.7E+04	9.4E+03	--	4.4E+04	1.5E+06	1.6E+05
Ethylene cyanohydrin	109-78-4	--	--	--	--	--	--	--	--

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		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
Ethylene diamine	107-15-3	--	--	--	--	--	--	--	--
Ethylene glycol	107-21-1	--	1.0E+02	--	--	--	1.8E+03	--	--
Ethylene glycol, monobutyl ether	111-76-2	--	4.2E+02	--	--	--	7.0E+03	--	--
Ethylene oxide	75-21-8	3.4E-04	7.8E+00	1.1E-02	9.3E-02	4.1E-02	1.3E+02	1.4E+00	1.1E+01
Ethylene thiourea (ETU)	96-45-7	2.2E-01	--	--	--	9.4E+00	--	--	--
Ethyl ether	60-29-7	--	--	--	--	--	--	--	--
Ethyl methacrylate	97-63-2	--	7.8E+01	2.6E+03	9.9E+03	--	1.3E+03	4.4E+04	1.7E+05
Ethyl p-nitrophenyl phenylphosphorothioate (EPN)	2104-64-5	--	--	--	--	--	--	--	--
Ethylphthalyl ethyl glycolate	84-72-0	--	--	--	--	--	--	--	--
Fenamiphos	22224-92-6	--	--	--	--	--	--	--	--
Fenpropathrin (Danitol)	39515-41-8	--	--	--	--	--	--	--	--
Fenvalerate (Pydrin)	51630-58-1	--	--	--	--	--	--	--	--
Fluometuron	2164-17-2	--	--	--	--	--	--	--	--
Fluoride	16984-48-8	--	3.4E+00	--	--	--	5.7E+01	--	--
Fluoridone	59756-60-4	--	--	--	--	--	--	--	--
Flurprimidol	56425-91-3	--	--	--	--	--	--	--	--
Flusilazole (NuStar)	85509-19-9	--	--	--	--	--	--	--	--
Flutolanil	66332-96-5	--	--	--	--	--	--	--	--
Fluvalinate	69409-94-5	--	--	--	--	--	--	--	--
Folpet	133-07-3	--	--	--	--	--	--	--	--
Fomesafen	72178-02-0	--	--	--	--	--	--	--	--
Fonofos	944-22-9	--	--	--	--	--	--	--	--
Formaldehyde	50-00-0	2.2E-01	2.6E+00	7.2E+00	2.5E+04	9.4E+00	4.3E+01	3.1E+02	1.1E+06
Formic acid	64-18-6	--	7.8E-02	2.6E+00	1.8E+04	--	1.3E+00	4.4E+01	3.0E+05
Fosetyl-al	39148-24-8	--	--	--	--	--	--	--	--
Furan	110-00-9	--	--	--	--	--	--	--	--
Furazolidone	67-45-8	--	--	--	--	--	--	--	--
Furfural	98-01-1	--	1.3E+01	4.3E+02	2.1E+05	--	2.2E+02	7.3E+03	3.6E+06
Furmecyclox	60568-05-0	3.3E-01	--	--	--	1.4E+01	--	--	--
Furothiazole (Furium)	531-82-8	6.5E-03	--	--	--	2.9E-01	--	--	--
Glufosinate-ammonium	77182-82-2	--	--	--	--	--	--	--	--
Glycidaldehyde	765-34-4	--	2.6E-01	8.7E+00	1.2E+04	--	4.4E+00	1.5E+02	2.1E+05
Glyphosate	1071-83-6	--	--	--	--	--	--	--	--
Haloxyfop-methyl	69806-40-2	--	--	--	--	--	--	--	--
Thifensulfuron-methyl (Harmony)	79277-27-3	--	--	--	--	--	--	--	--
Heptachlor	76-44-8	2.2E-03	--	7.2E-02	7.4E-01	9.4E-02	--	3.1E+00	3.2E+01
Heptachlor epoxide	1024-57-3	1.1E-03	--	3.6E-02	7.3E+00	4.7E-02	--	1.6E+00	NVT
Hexabromobenzene	87-82-1	--	--	--	--	--	--	--	--
Hexachlorobenzene	118-74-1	6.1E-03	--	2.0E-01	3.2E-01	2.7E-01	--	8.9E+00	NVT
Hexachlorobutadiene	87-68-3	1.3E-01	--	4.3E+00	8.8E-01	5.6E+00	--	1.9E+02	3.9E+01
alpha-Hexachlorocyclohexane (alpha-HCH)	319-84-6	1.6E-03	--	--	--	6.8E-02	--	--	--
beta-Hexachlorocyclohexane (beta-HCH)	319-85-7	5.3E-03	--	--	--	2.3E-01	--	--	--
gamma-Hexachlorocyclohexane (Lindane)	58-89-9	9.1E-03	--	--	--	4.0E-01	--	--	--
Hexachlorocyclohexane technical	608-73-1	5.5E-03	--	--	--	2.4E-01	--	--	--
Hexachlorocyclopentadiene	77-47-4	--	5.2E-02	1.7E+00	4.5E+00	--	8.8E-01	2.9E+01	7.5E+01
Hexachloroethane	67-72-1	2.6E-01	7.8E+00	8.5E+00	5.2E+00	1.1E+01	1.3E+02	3.7E+02	2.3E+02
Hexachlorophene	70-30-4	--	--	--	--	--	--	--	--

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-5: SUBSLAB AND EXTERIOR SOIL GAS and GROUNDWATER TO INDOOR AIR REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX/Cyclonite)	121-82-4	--	--	--	--	--	--	--	--
1,6-Hexamethylene diisocyanate	822-06-0	--	2.6E-03	8.7E-02	1.3E+00	--	4.4E-02	1.5E+00	2.2E+01
n-Hexane	110-54-3	--	1.8E+02	6.1E+03	4.7E+00	--	3.1E+03	1.0E+05	7.9E+01
Hexazinone	51235-04-2	--	--	--	--	--	--	--	--
Hexythiazox (Savey)	78587-05-0	--	--	--	--	--	--	--	--
Hydramethylnon (Amdro)	67485-29-4	--	--	--	--	--	--	--	--
Hydrazine, hydrazine sulfate	302-01-2	5.7E-04	7.8E-03	1.9E-02	6.2E+01	2.5E-02	1.3E-01	8.3E-01	2.7E+03
Hydrazine, dimethyl	57-14-7	--	5.2E-04	1.7E-02	2.0E+00	--	8.8E-03	2.9E-01	3.4E+01
Hydrogen chloride	7647-01-0	--	5.2E+00	1.7E+02	7.8E-08	--	8.8E+01	2.9E+03	1.3E-06
Hydrogen sulfide	7783-06-4	--	5.2E-01	1.7E+01	2.0E+00	--	8.8E+00	2.9E+02	3.4E+01
p-Hydroquinone	123-31-9	--	--	--	--	--	--	--	--
Imazaquin	81335-37-7	--	--	--	--	--	--	--	--
Imazethapyr (Pursuit)	81335-77-5	--	--	--	--	--	--	--	--
Iprodione	36734-19-7	--	--	--	--	--	--	--	--
Iron	7439-89-6	--	--	--	--	--	--	--	--
Isobutanol (Isobutyl alcohol)	78-83-1	--	--	--	--	--	--	--	--
Isophorone	78-59-1	--	5.2E+02	--	--	--	8.8E+03	--	--
Isopropalin	33820-53-0	--	--	--	--	--	--	--	--
Isopropyl methyl phosphonic acid	1832-54-8	--	--	--	--	--	--	--	--
Isoxaben	82558-50-7	--	--	--	--	--	--	--	--
Lactofen	77501-63-4	--	--	--	--	--	--	--	--
Lead +++	7439-92-1	--	--	--	--	--	--	--	--
Lead (tetraethyl)	78-00-2	--	--	--	--	--	--	--	--
Linuron	330-55-2	--	--	--	--	--	--	--	--
Lithium	7439-93-2	--	--	--	--	--	--	--	--
Malathion	121-75-5	--	--	--	--	--	--	--	--
Maleic anhydride	108-31-6	--	1.8E-01	--	--	--	3.1E+00	--	--
Maleic hydrazide	123-33-1	--	--	--	--	--	--	--	--
Malononitrile	109-77-3	--	--	--	--	--	--	--	--
Mancozeb	8018-01-7	--	--	--	--	--	--	--	--
Maneb	12427-38-2	--	--	--	--	--	--	--	--
Manganese (non-food) +++	7439-96-5	--	1.3E-02	--	--	--	2.2E-01	--	--
Mephosfolan	950-10-7	--	--	--	--	--	--	--	--
Mepiquat chloride (Mepiquat)	24307-26-4	--	--	--	--	--	--	--	--
Mercury and compounds	7487-94-7	--	7.8E-02	--	--	--	1.3E+00	--	--
Mercury (elemental)	7439-97-6	--	7.8E-02	2.6E+00	7.3E-01	--	1.3E+00	4.4E+01	1.2E+01
Mercury (methyl)	22967-92-6	--	--	--	--	--	--	--	--
Merphos	150-50-5	--	--	--	--	--	--	--	--
Merphos oxide	78-48-8	--	--	--	--	--	--	--	--
Metalaxyl	57837-19-1	--	--	--	--	--	--	--	--
Methacrylonitrile	126-98-7	--	7.8E+00	2.6E+02	1.6E+03	--	1.3E+02	4.4E+03	2.7E+04
Methamidophos	10265-92-6	--	--	--	--	--	--	--	--
Methanol	67-56-1	--	5.2E+03	1.7E+05	6.4E+07	--	8.8E+04	2.9E+06	NVT
Methidathion	950-37-8	--	--	--	--	--	--	--	--
Methomyl	16752-77-5	--	--	--	--	--	--	--	--
Methoxychlor	72-43-5	--	--	--	--	--	--	--	--
2-Methoxyethanol	109-86-4	--	5.2E+00	1.7E+02	9.3E+05	--	8.8E+01	2.9E+03	1.6E+07

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
2-Methoxyethanol acetate	110-49-6	--	2.6E-01	8.7E+00	5.9E+04	--	4.4E+00	1.5E+02	9.9E+05
2-Methoxy-5-nitroaniline	99-59-2	2.0E-01	--	--	--	8.8E+00	--	--	--
Methyl acetate	79-20-9	--	--	--	--	--	--	--	--
Methyl acrylate	96-33-3	--	5.2E+00	1.7E+02	1.3E+03	--	8.8E+01	2.9E+03	2.2E+04
2-Methylaniline hydrochloride	636-21-5	7.6E-02	--	--	--	3.3E+00	--	--	--
Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	17804-35-2	--	--	--	--	--	--	--	--
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	94-74-6	--	--	--	--	--	--	--	--
4-(2-Methyl-4-chlorophenoxy) butyric acid (MCPB)	94-81-5	--	--	--	--	--	--	--	--
2-(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)	93-65-2	--	--	--	--	--	--	--	--
4,4'-Methylenebisbenzeneamine	101-77-9	6.1E-03	5.2E+00	--	--	2.7E-01	8.8E+01	--	--
4,4'-Methylene bis(2-chloroaniline)	101-14-4	2.4E-03	--	--	--	2.9E-01	--	--	--
4,4'-Methylene bis(N,N'-dimethyl)aniline	101-61-1	2.2E-01	--	--	--	9.4E+00	--	--	--
Methylene bromide	74-95-3	--	1.0E+00	3.5E+01	6.5E+01	--	1.8E+01	5.8E+02	1.1E+03
Methylene chloride	75-09-2	1.0E+02	1.6E+02	3.4E+03	1.4E+03	1.2E+04	2.6E+03	8.8E+04	3.5E+04
4,4'-Methylenediphenyl isocyanate	101-68-8	--	1.6E-01	--	--	--	2.6E+00	--	--
2-(1-Methylethoxy)phenol methylcarbamate (Baygon)	114-26-1	--	--	--	--	--	--	--	--
Methyl ethyl ketone (2-Butanone)	78-93-3	--	1.3E+03	4.3E+04	1.1E+06	--	2.2E+04	7.3E+05	1.9E+07
Methyl isobutyl ketone (4-Methyl-2-pentanone)	108-10-1	--	7.8E+02	2.6E+04	3.1E+05	--	1.3E+04	4.4E+05	5.3E+06
Methyl methacrylate	80-62-6	--	1.8E+02	6.1E+03	3.3E+04	--	3.1E+03	1.0E+05	5.6E+05
2-Methyl-5-nitroaniline	99-55-8	--	--	--	--	--	--	--	--
Methyl parathion	298-00-0	--	--	--	--	--	--	--	--
2-Methylphenol	95-48-7	--	1.6E+02	--	--	--	2.6E+03	--	--
3-Methylphenol	108-39-4	--	1.6E+02	--	--	--	2.6E+03	--	--
4-Methylphenol	106-44-5	--	1.6E+02	--	--	--	2.6E+03	--	--
Methyl phosphonic acid	993-13-5	--	--	--	--	--	--	--	--
Methyl styrene (mixture)	25013-15-4	--	1.0E+01	3.5E+02	3.3E+02	--	1.8E+02	5.8E+03	5.6E+03
Methyl styrene (alpha)	98-83-9	--	--	--	--	--	--	--	--
Methyl tertbutyl ether (MTBE)	1634-04-4	1.1E+01	7.8E+02	3.6E+02	8.2E+02	4.7E+02	1.3E+04	1.6E+04	3.6E+04
Metolaclor (Dual)	51218-45-2	--	--	--	--	--	--	--	--
Metribuzin	21087-64-9	--	--	--	--	--	--	--	--
Metsulfuron-methyl (Ally)	74223-64-6	--	--	--	--	--	--	--	--
Mirex	2385-85-5	5.5E-04	--	1.8E-02	1.7E-02	2.4E-02	--	8.0E-01	7.3E-01
Molinate	2212-67-1	--	--	--	--	--	--	--	--
Molybdenum	7439-98-7	--	--	--	--	--	--	--	--
Monochloramine	10599-90-3	--	--	--	--	--	--	--	--
Myclobutanil (Systhane)	88671-89-0	--	--	--	--	--	--	--	--
Naled	300-76-5	--	--	--	--	--	--	--	--
Napropamide	15299-99-7	--	--	--	--	--	--	--	--
Nickel and compounds	7440-02-0	1.1E-02	2.3E-02	--	--	4.7E-01	3.9E-01	--	--
Nickel refinery dust	7440-02-0-NRD	1.2E-02	3.7E-03	--	--	5.1E-01	6.1E-02	--	--
Nickel subsulfide	12035-72-2	5.8E-03	3.7E-03	--	--	2.6E-01	6.1E-02	--	--
Nitrate	14797-55-8	--	--	--	--	--	--	--	--
Nitrite	14797-65-0	--	--	--	--	--	--	--	--
2-Nitroaniline	88-74-4	--	1.3E-02	--	--	--	2.2E-01	--	--
Nitrobenzene	98-95-3	7.0E-02	2.3E+00	2.3E+00	2.2E+02	3.1E+00	3.9E+01	1.0E+02	9.5E+03
Nitrofurantoin	67-20-9	--	--	--	--	--	--	--	--
Nitrofurazone	59-87-0	7.6E-03	--	--	--	3.3E-01	--	--	--

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
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CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
Nitroglycerin	55-63-0	--	--	--	--	--	--	--	--
Nitroguanidine	556-88-7	--	--	--	--	--	--	--	--
2-Nitropropane	79-46-9	1.0E-03	5.2E+00	3.5E-02	4.9E-01	4.5E-02	8.8E+01	1.5E+00	2.1E+01
N-Nitrosodi-n-butylamine	924-16-3	1.8E-03	--	5.8E-02	3.3E+00	7.7E-02	--	2.6E+00	1.4E+02
N-Nitrosodiethanolamine	1116-54-7	3.5E-03	--	--	--	1.5E-01	--	--	--
N-Nitrosodiethylamine	55-18-5	2.4E-05	--	--	--	2.9E-03	--	--	--
N-Nitrosodimethylamine	62-75-9	7.2E-05	1.0E-02	2.4E-03	9.7E-01	8.8E-03	1.8E-01	2.9E-01	1.2E+02
N-Nitrosodiphenylamine	86-30-6	1.1E+00	--	--	--	4.7E+01	--	--	--
N-Nitroso di-n-propylamine	621-64-7	1.4E-03	--	--	--	6.1E-02	--	--	--
N-Nitroso-N-methylethylamine	10595-95-6	4.5E-04	--	1.5E-02	7.6E+00	1.9E-02	--	6.5E-01	3.3E+02
N-Nitrosopyrrolidine	930-55-2	4.6E-03	--	--	--	2.0E-01	--	--	--
m-Nitrotoluene	99-08-1	--	--	--	--	--	--	--	--
o-Nitrotoluene	88-72-2	--	--	--	--	--	--	--	--
p-Nitrotoluene	99-99-0	--	--	--	--	--	--	--	--
Norflurazon	27314-13-2	--	--	--	--	--	--	--	--
Octabromodiphenyl ether	32536-52-0	--	--	--	--	--	--	--	--
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	--	--	--	--	--	--	--	--
Octamethylpyrophosphoramide	152-16-9	--	--	--	--	--	--	--	--
Oryzalin	19044-88-3	--	--	--	--	--	--	--	--
Oxadiazon	19666-30-9	--	--	--	--	--	--	--	--
Oxamyl	23135-22-0	--	--	--	--	--	--	--	--
Oxyfluorfen	42874-03-3	--	--	--	--	--	--	--	--
Paclobutrazol	76738-62-0	--	--	--	--	--	--	--	--
Paraquat	4685-14-7	--	--	--	--	--	--	--	--
Parathion	56-38-2	--	--	--	--	--	--	--	--
Pebulate	1114-71-2	--	--	--	--	--	--	--	--
Pendimethalin	40487-42-1	--	--	--	--	--	--	--	--
Pentabromo-6-chloro cyclohexane	87-84-3	--	--	--	--	--	--	--	--
Pentabromodiphenyl ether	32534-81-9	--	--	--	--	--	--	--	--
Pentachlorobenzene	608-93-5	--	--	--	--	--	--	--	--
Pentachloronitrobenzene	82-68-8	--	--	--	--	--	--	--	--
Pentachlorophenol	87-86-5	5.5E-01	--	--	--	2.4E+01	--	--	--
Perchlorate	14797-73-0	--	--	--	--	--	--	--	--
Perfluoroalkyl Compounds	**0.0E+00**								
Perfluoro-octanesulfonate (PFOS)^^	1763-23-1	--	--	--	--	--	--	--	--
Perfluorooctanoic acid (PFOA)^^	335-67-1	--	--	--	--	--	--	--	--
Permethrin	52645-53-1	--	--	--	--	--	--	--	--
Phenmedipham	13684-63-4	--	--	--	--	--	--	--	--
Phenol	108-95-2	--	5.2E+01	--	--	--	8.8E+02	--	--
m-Phenylenediamine	108-45-2	--	--	--	--	--	--	--	--
p-Phenylenediamine	106-50-3	--	--	--	--	--	--	--	--
Phenylmercuric acetate	62-38-4	--	--	--	--	--	--	--	--
2-Phenylphenol	90-43-7	--	--	--	--	--	--	--	--
Phorate	298-02-2	--	--	--	--	--	--	--	--
Phosmet	732-11-6	--	--	--	--	--	--	--	--
Phosphine	7803-51-2	--	7.8E-02	2.6E+00	7.8E-02	--	1.3E+00	4.4E+01	1.3E+00
Phosphoric acid	7664-38-2	--	2.6E+00	--	--	--	4.4E+01	--	--

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CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
Phosphorus (white)	7723-14-0	--	--	--	--	--	--	--	--
p-Phthalic acid	100-21-0	--	--	--	--	--	--	--	--
Phthalic anhydride	85-44-9	--	5.2E+00	--	--	--	8.8E+01	--	--
Picloram	1918-02-1	--	--	--	--	--	--	--	--
Pirimiphos-methyl	29232-93-7	--	--	--	--	--	--	--	--
Polybrominated biphenyls (PBBs)	59536-65-1	--	--	--	--	--	--	--	--
Polychlorinated biphenyls (PCBs)	1336-36-3	--	--	--	--	--	--	--	--
Aroclor 1016	12674-11-2	--	--	--	--	--	--	--	--
Aroclor 1221	11104-28-2	--	--	--	--	--	--	--	--
Aroclor 1232	11141-16-5	4.9E-03	--	1.6E-01	1.6E-01	2.2E-01	--	7.2E+00	7.2E+00
Aroclor 1242	53469-21-9	4.9E-03	--	1.6E-01	3.5E-01	2.2E-01	--	7.2E+00	1.5E+01
Aroclor 1248	12672-29-6	4.9E-03	--	1.6E-01	2.7E-01	2.2E-01	--	7.2E+00	1.2E+01
Aroclor 1254	11097-69-1	4.9E-03	--	1.6E-01	4.3E-01	2.2E-01	--	7.2E+00	1.9E+01
Aroclor 1260	11096-82-5	4.9E-03	--	1.6E-01	3.6E-01	2.2E-01	--	7.2E+00	NVT
Polynuclear aromatic hydrocarbons (PAHs)									
Acenaphthene	83-32-9	--	--	--	--	--	--	--	--
Anthracene	120-12-7	--	--	--	--	--	--	--	--
Benz[a]anthracene	56-55-3	1.7E-02	--	5.6E-01	NVT	2.0E+00	--	NVT	NVT
Benzo[a]pyrene	50-32-8	1.7E-03	5.2E-04	--	--	2.0E-01	8.8E-03	--	--
Benzo[b]fluoranthene	205-99-2	1.7E-02	--	--	--	2.0E+00	--	--	--
Benzo[k]fluoranthene	207-08-9	1.7E-01	--	--	--	2.0E+01	--	--	--
Chrysene	218-01-9	1.7E+00	--	--	--	2.0E+02	--	--	--
Dibenz[ah]anthracene	53-70-3	1.7E-03	--	--	--	2.0E-01	--	--	--
Fluoranthene	206-44-0	--	--	--	--	--	--	--	--
Fluorene	86-73-7	--	--	--	--	--	--	--	--
Indeno[1,2,3-cd]pyrene	193-39-5	1.7E-02	--	--	--	2.0E+00	--	--	--
Naphthalene	91-20-3	8.3E-02	7.8E-01	2.8E+00	1.3E+01	3.6E+00	1.3E+01	1.2E+02	5.9E+02
Pyrene	129-00-0	--	--	--	--	--	--	--	--
Prochloraz	67747-09-5	--	--	--	--	--	--	--	--
Profluralin	26399-36-0	--	--	--	--	--	--	--	--
Prometon	1610-18-0	--	--	--	--	--	--	--	--
Prometryn	7287-19-6	--	--	--	--	--	--	--	--
Propyzamide (Pronamide)	23950-58-5	--	--	--	--	--	--	--	--
Propachlor	1918-16-7	--	--	--	--	--	--	--	--
Propanil	709-98-8	--	--	--	--	--	--	--	--
Propargite	2312-35-8	--	--	--	--	--	--	--	--
Propargyl alcohol	107-19-7	--	--	--	--	--	--	--	--
Propazine	139-40-2	--	--	--	--	--	--	--	--
Propham	122-42-9	--	--	--	--	--	--	--	--
Propiconazole	60207-90-1	--	--	--	--	--	--	--	--
n-Propylbenzene	103-65-1	--	2.6E+02	8.7E+03	1.6E+03	--	4.4E+03	1.5E+05	2.6E+04
Propylene glycol	57-55-6	--	--	--	--	--	--	--	--
Propylene glycol, monoethyl ether	52125-53-8	--	5.2E+02	1.7E+04	3.0E+07	--	8.8E+03	2.9E+05	5.0E+08
Propylene glycol, monomethyl ether	107-98-2	--	5.2E+02	1.7E+04	3.0E+07	--	8.8E+03	2.9E+05	5.0E+08
Propylene oxide	75-56-9	7.6E-01	7.8E+00	2.5E+01	4.7E+02	3.3E+01	1.3E+02	1.1E+03	2.1E+04
Pyridine	110-86-1	--	--	--	--	--	--	--	--
Quinalphos	13593-03-8	--	--	--	--	--	--	--	--

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-5: SUBSLAB AND EXTERIOR SOIL GAS and GROUNDWATER TO INDOOR AIR REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
Quinoline	91-22-5	--	--	--	--	--	--	--	--
Resmethrin	10453-86-8	--	--	--	--	--	--	--	--
Ronnel	299-84-3	--	--	--	--	--	--	--	--
Rotenone	83-79-4	--	--	--	--	--	--	--	--
Selenious Acid	7783-00-8	--	--	--	--	--	--	--	--
Selenium	7782-49-2	--	5.2E+00	--	--	--	8.8E+01	--	--
Sethoxydim	74051-80-2	--	--	--	--	--	--	--	--
Silver and compounds	7440-22-4	--	--	--	--	--	--	--	--
Simazine	122-34-9	--	--	--	--	--	--	--	--
Sodium azide	26628-22-8	--	--	--	--	--	--	--	--
Sodium diethyldithiocarbamate	148-18-5	--	--	--	--	--	--	--	--
Sodium fluoroacetate	62-74-8	--	--	--	--	--	--	--	--
Sodium metavanadate	13718-26-8	--	--	--	--	--	--	--	--
Strontium, stable	7440-24-6	--	--	--	--	--	--	--	--
Strychnine	57-24-9	--	--	--	--	--	--	--	--
Styrene	100-42-5	--	2.6E+02	8.7E+03	5.5E+03	--	4.4E+03	1.5E+05	9.3E+04
1,1'-Sulfonylbis (4-Chlorobenzene)	80-07-9	--	--	--	--	--	--	--	--
Tebuthiuron	34014-18-1	--	--	--	--	--	--	--	--
Temephos	3383-96-8	--	--	--	--	--	--	--	--
Terbacil	5902-51-2	--	--	--	--	--	--	--	--
Terbufos	13071-79-9	--	--	--	--	--	--	--	--
Terbutryn	886-50-0	--	--	--	--	--	--	--	--
1,2,4,5-Tetrachlorobenzene	95-94-3	--	--	--	--	--	--	--	--
2,3,7,8-Tetrachlorodibenzo-p-dioxin (Dioxin)	1746-01-6	7.4E-08	1.0E-05	2.5E-06	3.6E-05	3.2E-06	1.8E-04	1.1E-04	1.6E-03
1,1,1,2-Tetrachloroethane	630-20-6	3.8E-01	--	1.3E+01	9.6E+00	1.7E+01	--	5.5E+02	4.2E+02
1,1,2,2-Tetrachloroethane	79-34-5	4.8E-02	--	1.6E+00	7.8E+00	2.1E+00	--	7.0E+01	3.4E+02
Tetrachloroethylene (PCE)	127-18-4	1.1E+01	1.0E+01	3.5E+02	3.2E+01	4.7E+02	1.8E+02	5.8E+03	5.4E+02
2,3,4,6-Tetrachlorophenol	58-90-2	--	--	--	--	--	--	--	--
p,a,a,a-Tetrachlorotoluene	5216-25-1	--	--	--	--	--	--	--	--
Tetrachlorovinphos (Stirofos)	961-11-5	--	--	--	--	--	--	--	--
Tetraethyldithiopyrophosphate	3689-24-5	--	--	--	--	--	--	--	--
Thallium and compounds	7440-28-0	--	--	--	--	--	--	--	--
Thiobencarb	28249-77-6	--	--	--	--	--	--	--	--
Thiofanox	39196-18-4	--	--	--	--	--	--	--	--
Thiophanate-methyl	23564-05-8	--	--	--	--	--	--	--	--
Thiram	137-26-8	--	--	--	--	--	--	--	--
Tin and compounds	7440-31-5	--	--	--	--	--	--	--	--
Toluene	108-88-3	--	1.3E+03	4.3E+04	1.0E+04	--	2.2E+04	7.3E+05	1.7E+05
p-Toluidine	106-49-0	--	--	--	--	--	--	--	--
Tralomethrin	66841-25-6	--	--	--	--	--	--	--	--
Triadimefon (Bayleton)	43121-43-3	--	--	--	--	--	--	--	--
Triallate	2303-17-5	--	--	--	--	--	--	--	--
Triasulfuron	82097-50-5	--	--	--	--	--	--	--	--
Tribenuron-methyl (Express)	101200-48-0	--	--	--	--	--	--	--	--
1,2,4-Tribromobenzene	615-54-3	--	--	--	--	--	--	--	--
Tributyltin oxide (TBTO)	56-35-9	--	--	--	--	--	--	--	--
2,4,6-Trichloroaniline	634-93-5	--	--	--	--	--	--	--	--

Nebraska Department of Environmental Quality Voluntary Cleanup Program Remedial Goals
TABLE B-5: SUBSLAB AND EXTERIOR SOIL GAS and GROUNDWATER TO INDOOR AIR REMEDIAL GOALS

CONTAMINANT	CAS No.	RESIDENTIAL VAPOR INTRUSION				INDUSTRIAL VAPOR INTRUSION			
		Indoor Air		Soil Gas	Groundwater	Indoor Air		Soil Gas	Groundwater
		TCR = 1E-06	THQ = 0.25	TCR=1E-06/ THQ=0.25	TCR=1E-06/ THQ=0.25	TCR = 1E-05	THQ = 1.0	TCR=1E-05/ THQ=1.0	TCR=1E-05/ THQ=1.0
		(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/L)
2,4,6-Trichloroaniline hydrochloride	33663-50-2	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	120-82-1	--	5.2E-01	1.7E+01	2.7E+01	--	8.8E+00	2.9E+02	4.5E+02
1,1,1-Trichloroethane	71-55-6	--	1.3E+03	4.3E+04	3.6E+03	--	2.2E+04	7.3E+05	6.0E+04
1,1,2-Trichloroethane	79-00-5	1.8E-01	5.2E-02	1.7E+00	3.4E+00	7.7E+00	8.8E-01	2.9E+01	5.8E+01
Trichloroethylene (TCE) Long-term +++	79-01-6	4.8E-01	5.2E-01	1.6E+01	2.4E+00	3.0E+01	8.8E+00	2.9E+02	4.4E+01
Trichloroethylene (TCE) Short-term ‡	79-01-6	4.8E-01	5.2E-01	1.6E+01	2.4E+00	3.0E+01	8.8E+00	2.9E+02	4.4E+01
Trichlorofluoromethane	75-69-4	--	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	95-95-4	--	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	88-06-2	9.1E-01	--	--	--	4.0E+01	--	--	--
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)	93-76-5	--	--	--	--	--	--	--	--
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex)	93-72-1	--	--	--	--	--	--	--	--
1,1,2-Trichloropropane	598-77-6	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	96-18-4	--	7.8E-02	2.6E+00	1.4E+01	--	1.3E+00	4.4E+01	2.4E+02
1,2,3-Trichloropropene	96-19-5	--	7.8E-02	2.6E+00	1.1E-01	--	1.3E+00	4.4E+01	1.8E+00
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	--	1.3E+03	4.3E+04	1.1E+02	--	2.2E+04	7.3E+05	1.8E+03
Tridiphane	58138-08-2	--	--	--	--	--	--	--	--
Triethylamine	121-44-8	--	1.8E+00	6.1E+01	6.5E+02	--	3.1E+01	1.0E+03	1.1E+04
Trifluralin	1582-09-8	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	95-63-6	--	1.6E+01	5.2E+02	1.6E+02	--	2.6E+02	8.8E+03	2.8E+03
1,3,5-Trimethylbenzene	108-67-8	--	1.6E+01	--	--	--	2.6E+02	--	--
Trimethyl phosphate	512-56-1	--	--	--	--	--	--	--	--
1,3,5-Trinitrobenzene	99-35-4	--	--	--	--	--	--	--	--
Trinitrophenylmethylnitramine (Tetryl)	479-45-8	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene (TNT)	118-96-7	--	--	--	--	--	--	--	--
Triphenylphosphine oxide	791-28-6	--	--	--	--	--	--	--	--
Tris(2-chloroethyl) phosphate	115-96-8	--	--	--	--	--	--	--	--
Uranium (chemical toxicity only)	7440-61-0	--	1.0E-02	--	--	--	1.8E-01	--	--
Vanadium and compounds +++	7440-62-2	--	2.6E-02	--	--	--	4.4E-01	--	--
Vernolate (Vernam)	1929-77-7	--	--	--	--	--	--	--	--
Vinclozolin	50471-44-8	--	--	--	--	--	--	--	--
Vinyl acetate	108-05-4	--	5.2E+01	1.7E+03	5.2E+03	--	8.8E+02	2.9E+04	8.7E+04
Vinyl bromide	593-60-2	8.8E-02	7.8E-01	2.9E+00	2.7E-01	3.8E+00	1.3E+01	1.3E+02	1.2E+01
Vinyl chloride +++	75-01-4	1.7E-01	2.6E+01	5.6E+00	2.2E-01	2.8E+01	4.4E+02	9.3E+02	3.7E+01
Warfarin	81-81-2	--	--	--	--	--	--	--	--
Xylenes	1330-20-7	--	2.6E+01	8.7E+02	2.3E+02	--	4.4E+02	1.5E+04	3.8E+03
Zinc	7440-66-6	--	--	No VP	No VP	--	--	No VP	No VP
Zinc phosphide	1314-84-7	--	--	No VP	No VP	--	--	No VP	No VP
Zineb	12122-67-7	--	--	--	--	--	--	--	--

Notes:

+++ See Section 5.4 of Appendix A, Protocol for VCP Remediation Goal Lookup Tables, Nebraska Voluntary Cleanup Program for more information.

-- = Not available/not applicable

µg/L = Micrograms per liter

µg/m^3 = Micrograms per cubic meter

ca = cancer

CAS No. = Chemical Abstract Service Number

nc = noncancer

NVT = Not sufficiently volatile or toxic (in selected exposure scenario)

TCR = Target cancer risk

THQ = Target hazard quotient

ATTACHMENT C

STANDARDIZED EQUATIONS FOR CALCULATING THE VCP REMEDIATION GOALS

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EQUATIONS AND EXPOSURE PARAMETERS FOR CALCULATING THE VCP REMEDIATION GOALS

The equations used to calculate the Nebraska Voluntary Cleanup Program (VCP) remediation goals (RG) for carcinogenic risks and noncarcinogenic effects are presented herein. Note: the VCP RG lookup tables (Attachment B) also include pathway-specific VCP RGs if the user decides against combining specific exposure pathways or if the user wants to identify the relative contribution of each pathway to exposure.

To calculate VCP RGs for volatile contaminants in soil, a chemical-specific volatilization factor is calculated per the volatization factor (VF_s) equation presented here. Because of its reliance on Henry's law, the VF_s model applies only when the contaminant concentration in soil is at or below saturation (i.e., no free-phase contaminant is present). Soil saturation ("sat") corresponds to the contaminant concentration in soil at which the adsorptive limits of the soil particles and the solubility limits of the available soil moisture have been reached. Above this point, pure liquid-phase contaminant is expected in the soil. If the VCP RG calculated using VF_s exceeds the calculated "sat," the VCP RG was set equal to "sat," in accordance with the "Soil Screening Guidance" (U.S. EPA 1996a, 1996b). The equation for deriving "sat" is presented in this attachment.

VCP RG Equations

All terms within the equations are defined in the text or in **Table C-1** at the end of the attachment. Consistent with U.S. Environmental Protection Agency (U.S. EPA) guidance (2005, 2018), there are separate equations for the various types of chemicals – those that are carcinogenic, noncarcinogenic, mutagenic and also specific equations for trichloroethylene and vinyl chloride – and the equations are grouped by media (U.S. EPA 2017). Those compounds that are mutagenic are noted in Table B-2. For mutagenic compounds, the exposure rates take into account age-specific susceptibility to mutagens through the use of an age dependent adjustment factor (ADAF). For the inhalation pathway, exposure durations were adjusted to account for mutagenic potential.

Residential Soils

Carcinogenic

Residential Soil Incidental Ingestion – Carcinogenic Risks

$$C_{res\ soil\ \ ingestion-ca}\ (mg/kg) = \frac{TR_r \times AT_c}{EF_r \times \left(\frac{IFS_{adj} \times SF_o}{1E+06\, mg/kg}\right)}$$

where:

$$IFS_{adj}\left(\frac{mg-Year}{Kg-day}\right) = \left(\frac{ED_c \times IRS_c}{BW_c}\right) + \left(\frac{ED_r - ED_c \times IRS_a}{BW_a}\right)$$

Residential Dermal Exposure to Soil – Carcinogenic Risks

$$C_{res\ soil\ \ dermal-ca}\ (mg/kg) = \frac{TR_r \times AT_c}{EF_r \times \left(\frac{DFS_{adj} \times ABS_d \times [SF_o / ABS_{GI}]}{1E+06\, mg/kg}\right)}$$

where:

$$DFS_{adj}\left(\frac{mg-Year}{Kg-day}\right) = \frac{ED_c \times SA_c \times AF_c}{BW_c} + \frac{ED_r - ED_c \times SA_a \times AF_a}{BW_a}$$

Residential Soil Inhalation– Carcinogenic Risks

$$C_{res\ soil\ \ inhalation-ca}\ (mg/kg) = \frac{TR_r \times AT_{c-inh}}{EF_r \times ED_a \times IUR \times 1000\,\mu g/mg \times \left(\frac{1}{VF} + \frac{1}{PEF}\right)}$$

Combined Residential Soil Equation - Carcinogenic Risk

$$C_{res\ soil\text{-}ca} = \frac{1}{\frac{1}{C_{res\ soil\ \ ingestion-ca}} + \frac{1}{C_{res\ soil\ \ dermal-ca}} + \frac{1}{C_{res\ soil\ \ inhalation-ca}}}$$

Noncancer

Residential Soil Incidental Ingestion – Noncarcinogenic Effects (Child)

$$C_{res\,soil\ ingestion-nc}\ (mg/kg) = \frac{THQ_r \times BW_c \times AT_{nc-c}}{EF_r \times ED_{r-c} \times \left(\frac{RBA}{RfD_o}\right) \times IRS_{r-c} \times 1E-06 \frac{kg}{mg}}$$

Residential Dermal Exposure to Soil – Noncarcinogenic Effects

$$C_{res\,soil\ \ dermal-nc}\ (mg/kg) = \frac{THQ_r \times BW_c \times AT_{n-c}}{EF_r \times ED_{r-c} \times \left(\frac{1}{[RfD_o \times ABS_{GI}]}\right) \times SA_{r-c} \times AF_{r-c} \times ABS_d \times 1E-06 \frac{kg}{mg}}$$

Residential Soil Inhalation– Noncarcinogenic Effects

$$C_{res\,soil\ \ inhalation-nc}\ (mg/kg) = \frac{THQ_r \times AT_{nc-c}}{EF_r \times ED_{r-c} \times ET_r \times \left(\frac{1day}{24hours}\right) \times \left(\frac{1}{RfC}\right) \times \left(\frac{1}{VF} + \frac{1}{PEF}\right)}$$

Combined Residential Soil Equation - Noncarcinogenic Effects

$$C_{\ res\ soil\ -\ nc}\ (mg/kg) = \frac{1}{\frac{1}{C_{res\,soil\ ingestion-nc}} + \frac{1}{C_{res\,soil\ dermal-nc}} + \frac{1}{C_{res\,soil\ inhalation-nc}}}$$

Mutagenic

Residential Soil Incidental Ingestion – Mutagenic Risks

$$C_{res\,soil\ \ ingestion-m}\ (mg/kg) = \frac{TR_r \times AT_c}{SF_o \times RBA \times EF_r \times IFSM_{adj} \times 1E-06 \frac{kg}{mg}}$$

where:

$$IFS(M)_{adj} = \frac{ED_{0-2} \times IRS_c \times ADAF_{0-2}}{BW_c} + \frac{ED_{2-6} \times IRS_c \times ADAF_{2-6}}{BW_c} + \frac{ED_{6-16} \times IRS_a \times ADAF_{6-16}}{BW_a} + \frac{ED_{16-26} \times IRS_a \times ADAF_{16-26}}{BW_a}$$

Residential Dermal Exposure to Soil – Mutagenic Risks

$$C_{res\,soil\ dermal-m}\ (mg/kg) = \frac{TR_r \times AT_c}{EF_r \times \left(\frac{DFSM_{adj} \times ABS_d \times [SF_o / ABS_{GI}]}{1E+06\, mg/kg} \right)}$$

where:

$$DFS(M)_{adj} = \frac{ED_{0-2} \times SA_c \times AF_c \times 10}{BW_c} + \frac{ED_{2-6} \times SA_c \times AF_c \times 3}{BW_c} + \frac{ED_{6-16} \times SA_a \times AF_a \times 3}{BW_a} + \frac{ED_{16-26} \times SA_a \times AF_a \times 1}{BW_a}$$

Residential Soil Inhalation– Mutagenic Risks

$$C_{res\,soil\ inhalation-m}\ (mg/kg) = \frac{TR_r\ x\ AT_c}{IUR \times \left(\frac{1}{VF} + \frac{1}{PEF} \right) \times 1000 \frac{\mu g}{mg} \times ET_r \times \frac{1day}{24hours} \times EF_R \times EDM}$$

where:

$$EDM = ED_{0-2} \times 10 + ED_{2-6} \times 3 + ED_{6-16} \times 3 + ED_{16-26} \times 1$$

Combined Residential Soil Equation - Mutagenic Risks

$$C_{res\,soil-m}\ (mg/kg) = \frac{1}{\frac{1}{C_{res\,soil\ ingestion-m}} + \frac{1}{C_{res\,soil\ dermal-m}} + \frac{1}{C_{res\,soil\ inhalation-m}}}$$

Trichloroethylene (TCE)

Note: Only the incidental ingestion and inhalation pathways are evaluated for TCE in soil because it is a volatile compound.

Residential Soil Incidental Ingestion – TCE Carcinogenic/Mutagenic Risks

$$C_{res\,soil\ ingestion-TCE}\ (mg/kg) = \frac{TR_r \times AT_c}{SF_O \times EF_r \times 1E-06 \frac{kg}{mg} \times [IFS_{adj} \times CAFo + IFSM_{adj} \times MAFo]}$$

where:

$$IFS_{adj}\left(\frac{mg-Year}{Kg-day}\right) = \left(\frac{ED_c \times IRS_c}{BW_c}\right) + \left(\frac{ED_r - ED_c \times IRS_a}{BW_a}\right)$$

$$IFS(M)_{adj} = \frac{ED_{0-2} \times IRS_{child} \times ADAF_{0-2}}{BW_{child}} + \frac{ED_{2-6} \times IRS_{child} \times ADAF_{2-6}}{BW_{child}} + \frac{ED_{6-16} \times IRS_{adult} \times ADAF_{6-16}}{BW_{adult}} + \frac{ED_{16-30} \times IRS_{adult} \times ADAF_{16-30}}{BW_{adult}}$$

Residential Soil Inhalation – TCE Carcinogenic/Mutagenic Risks

$$C_{res\ soil\ inhalation-TCE}\ (mg/kg) = \frac{TR_r\ x\ AT_c}{IUR \times \left(\frac{1}{VF} + \frac{1}{PEF}\right) \times 1000\frac{\mu g}{mg} \times ET_r \times \frac{1day}{24hours} \times EF_R \times \left(ED_r \times CAF_i + EDM_r \times MAF_i\right)}$$

where:

$$EDM = ED_{0-2} \times 10 + ED_{2-6} \times 3 + ED_{6-16} \times 3 + ED_{16-26} \times 1$$

Combined Residential Soil Equation – TCE Risks

$$C_{res\ soil\ -\ TCE} = \frac{1}{\frac{1}{C_{res\ soil\ ingestion-TCE}} + \frac{1}{C_{res\ soil\ inhalation-TCE}}}$$

Vinyl Chloride

Note: Only the incidental ingestion and inhalation pathways are evaluated for vinyl chloride in soil because it is a volatile compound.

Residential Soil Incidental Ingestion – Vinyl Chloride Carcinogenic/Mutagenic Risks

$$C_{res\ soil\ ingestion-VC}\ (mg/kg) = \frac{TR_r}{\left(\frac{SF_o \times EF_r \times IFS_{adj} \times 1E-06\frac{kg}{mg}}{AT_c}\right) + \left(\frac{SF_o \times IRS_c \times 1E-06\frac{kg}{mg}}{BW_c}\right)}$$

where:

$$IFS_{adj}\left(\frac{mg-Year}{Kg-day}\right) = \left(\frac{ED_c \times IRS_c}{BW_c}\right) + \left(\frac{ED_r - ED_c \times IRS_a}{BW_a}\right)$$

Residential Soil Inhalation – Vinyl Chloride Carcinogenic/Mutagenic Risks

$$C_{res\ soil\ inhalation-VC}\ (mg/kg) = \frac{TR_r}{\left(\frac{IUR \times EF_r \times ED_r \times ET_r \times \frac{1day}{24hours} \times 1000\frac{\mu g}{mg}}{AT_c \times VF}\right) + \left(\frac{IUR}{VF_s} \times 1000\frac{\mu g}{mg}\right)}$$

Combined Residential Soil Equation – Vinyl Chloride Effects

$$C_{res\ soil\text{-}VC} = \frac{1}{\frac{1}{C_{res\ soil\ ingestion-VC}} + \frac{1}{C_{res\ soil\ inhalation-VC}}}$$

Industrial Soil

Carcinogenic

Industrial Soil Incidental Ingestion – Carcinogenic Risks

$$C_{ind\ soil\ ingestion-ca}\ (mg/kg) = \frac{TR_w \times BW_a \times AT_c}{EF_w \times ED_w \times \left(\frac{IRS_w \times SF_o}{1E+06\, mg/kg}\right)}$$

Industrial Dermal Exposure to Soil – Carcinogenic Risks

$$C_{ind\ soil\ dermal-ca}\ (mg/kg) = \frac{TR_w \times BW_a \times AT_c}{EF_w \times ED_w \times \left(\frac{SA_{a-w} \times AF_{a-w} \times ABS_d \times SF_o / ABS_{GI}}{1E+06\, mg/kg}\right)}$$

Industrial Soil Inhalation– Carcinogenic Risks

$$C_{ind\ soil\ inhalation-ca}\ (mg/kg) = \frac{TR_w \times AT_{c-inh}}{EF_w \times ED_w \times ET_w \times \left(\frac{1000\,\mu g/mg\ x\ IUR}{VF_s}\right)}$$

Combined Industrial Soil Equation – Carcinogenic Risks

$$\frac{1}{\frac{1}{C_{ind\ soil\ ingestion-ca}} + \frac{1}{C_{ind\ soil\ dermal-ca}} + \frac{1}{C_{ind\ soil\ inhalation-ca}}}$$

Noncancer

Industrial Soil Incidental Ingestion – Noncarcinogenic Effects

$$C_{ind\ soil\ ingestion-nc}\ (mg/kg) = \frac{THQ_w \times BW_a \times AT_n}{EF_w \times ED_w \times \left(\frac{1}{RfD_o} \times \frac{IRS_w}{1E+06\, mg/kg}\right)}$$

Industrial Dermal Exposure to Soil – Noncarcinogenic Effects

$$C_{ind\ soil\ dermal-nc}\ (mg/kg) = \frac{THQ_w \times BW_a \times AT_n}{EF_w \times ED_w \times \left(\frac{1}{[RfD_o \times ABS_{GI}]} \times \frac{SA_{a-w} \times AF_{a-w} \times ABS_d}{1E+06\, mg/kg} \right)}$$

Industrial Soil Inhalation– Noncarcinogenic Effects

$$C_{ind\ soil\ ingestion-nc}\ (mg/kg) = \frac{THQ_w \times RfC \times AT_{n-inh}}{EF_w \times ED_w \times ET_w \times \left(\frac{1}{VF} + \frac{1}{PEF} \right)}$$

Combined Industrial Soil Equation - Noncarcinogenic Effects

$$C_{ind\ soil-nc} = \frac{1}{\frac{1}{C_{ind\ soil\ ingestion-nc}} + \frac{1}{C_{ind\ soil\ dermal-nc}} + \frac{1}{C_{ind\ soil\ inhalation-nc}}}$$

Groundwater Equations: For groundwater, equations were based on ingestion, dermal contact, and inhalation of vapors (volatile compounds only).

Carcinogenic

Ground Water Ingestion – Carcinogenic Risks

$$C_{wat\ ingestion-ca}\ (\mu g/L) = \frac{TR_r \times AT_c \times 1000\,\mu g/mg}{SF_o \times EF_r \times IFW_{adj}}$$

where:

$$IFW_{adj} = \frac{ED_c \times IRW_c}{BW_c} + \frac{ED_r - ED_c \times IRW_a}{BW_a}$$

Ground Water Dermal Contact – Carcinogenic Risks

If EPD is Yes, then:

For Inorganics:

$$C_{wat\ dermal-ca}\ (\mu g/L) = \frac{DA_{event} \times 1000 \frac{cm^3}{L}}{2 \times FA \times Kp \times ET_b}$$

For Organics:

If ET ≤ t*, then:

$$C_{wat\ dermal-ca}\ (\mu g/L) = \frac{DA_{event} \times 1000 \frac{cm^3}{L}}{2 \times FA \times Kp \times \sqrt{\frac{6 \times \tau_{event} \times ET_b}{\Pi}}}$$

If ET > t*, then:

$$C_{wat\ dermal-ca}\ (\mu g/L) = \frac{DA_{event} \times 1000 \frac{cm^3}{L}}{FA \times Kp \times \left[\frac{ET_b}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]}$$

where:

$$DA_{event} = \frac{TR_r \times AT_c \times 1000 \frac{\mu g}{mg}}{\left(\frac{SFo}{ABS_{GI}}\right) \times EF_r \times DFW_{adj}}$$

$$DFW_{adj} = \frac{ED_c \times SA_c}{BW_c} + \frac{(ED_r - ED_c) \times SA_a}{BW_a}$$

Ground Water Inhalation – Carcinogenic Risks

$$C_{wat\ inhalation-ca}\ (\mu g / L) = \frac{TR_r \times AT_c}{EF_r \times ED_r \times ET_r \times K \times CF_i \times IUR}$$

Combined Ground Water Equation – Carcinogenic Contaminants

$$C_{wat\ gw\text{-}ca} = \frac{1}{\frac{1}{C_{wat\ ingestion-ca}} + \frac{1}{C_{wat\ dermal-ca}} + \frac{1}{C_{wat\ inhalation-ca}}}$$

Noncancer

Ground Water Ingestion – Noncarcinogenic Effects

$$C_{wat\ ingestion-nc}\ (\mu g / L) = \frac{THQ_r \times BW_c \times AT_{nc-c} \times 1000\ \mu g / mg}{EF_r \times ED_c \times \left(\frac{1}{RfD_o}\right) \times IRW_c}$$

Ground Water Dermal Contact – Noncarcinogenic Effects

If EPD is Yes, then:

For Inorganics:

$$C_{wat\ dermal-nc}\ (\mu g / L) = \frac{DA_{event} \times 1000 \frac{cm^3}{L}}{2 \times ET_b}$$

For Organics:

If ET ≤ t*, then:

$$C_{wat\ dermal-ca}\ (\mu g/L) = \frac{DA_{event} \times 1000 \frac{cm^3}{L}}{2 \times FA \times Kp \times \sqrt{\frac{6 \times \tau_{event} \times ET_b}{\Pi}}}$$

If ET > t*, then:

$$C_{wat\ dermal-ca}\ (\mu g/L) = \frac{DA_{event} \times 1000 \frac{cm^3}{L}}{FA \times Kp \times \left[\frac{ET_b}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]}$$

where:

$$DA_{event} = \frac{THQ_r \times AT_{nc-c} \times 1000 \frac{\mu g}{mg}}{\left(\frac{1}{RfDo \times ABS_{GI}} \right) \times ED_c \times EF_r \times SA_c}$$

$$DFW_{adj} = \frac{ED_c \times SA_c}{BW_c} + \frac{(ED_r - ED_c) \times SA_a}{BW_a}$$

Ground Water Inhalation – Noncarcinogenic Effects

$$C_{wat\ inhalation-nc}\ (\mu g/L) = \frac{THQ_r \times AT_{nc} \times 1000\ \mu g/mg}{EF_r \times ED_c \times ET_c \times \left(\frac{1day}{24hours} \right) \times \left(\frac{1}{RfC} \right) \times K}$$

Combined Ground Water Equation – Noncarcinogenic Contaminants

$$C_{wat\ gw\text{-}nc} = \frac{1}{\frac{1}{C_{wat\ ingestion-nc}} + \frac{1}{C_{wat\ dermal-nc}} + \frac{1}{C_{wat\ inhalation-nc}}}$$

Mutagenic

Ground Water Ingestion – Mutagenic Risks

$$C_{wat\ ingestion-ca}\ (\mu g/L) = \frac{TR_r \times AT_c \times 1000\,\mu g/mg}{EF_r \times IFW(M)_{adj} \times SF_o}$$

where:

$$IFWM_{adj} = \frac{ED_{0-2} \times IFW_{child} \times ADAF_{0-2}}{BW_{child}} + \frac{ED_{2-6} \times IFW_{child} \times ADAF_{2-6}}{BW_{child}} + \frac{ED_{6-16} \times IFW_{adult} \times ADAF_{6-16}}{BW_{adult}} + \frac{ED_{16-30} \times IFW_{adult} \times ADAF_{16-30}}{BW_{adult}}$$

Ground Water Dermal Contact – Mutagenic Risks

If EPD is Yes, then:

For Inorganics:

$$C_{wat\ dermal-ca}\ (\mu g/L) = \frac{DA_{event} \times 1000\frac{cm^3}{L}}{2 \times FA \times Kp \times ET_b}$$

For Organics:

If ET ≤ t*, then:

$$C_{wat\ dermal-ca}\ (\mu g/L) = \frac{DA_{event} \times 1000\frac{cm^3}{L}}{2 \times FA \times Kp \times \sqrt{\frac{6 \times \tau_{event} \times ET_b}{\Pi}}}$$

If ET > t*, then:

$$C_{wat\ dermal-ca}\ (\mu g/L) = \frac{DA_{event} \times 1000\frac{cm^3}{L}}{FA \times Kp \times \left[\frac{ETb_{adj}}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]}$$

where:

$$DA_{event} = \frac{TR_r \times AT_c \times 1000\frac{\mu g}{mg}}{\left(\frac{SFo}{ABS_{GI}}\right) \times EF_r \times DFWM_{adj}}$$

$$DFWM_{adj} = \frac{ED_{0-2} \times SA_c \times 10}{BW_c} + \frac{ED_{2-6} \times SA_c \times 3}{BW_c} + \frac{ED_{6-16} \times SA_a \times 3}{BW_a} + \frac{ED_{16-26} \times SA_a \times 1}{BW_a}$$

Ground Water Inhalation – Mutagenic Risks

$$C_{wat\ inhalation-m}\ (\mu g / L) = \frac{TR_r \times AT_c}{EF_r \times EDM \times ET_r \times K \times CF_i \times IUR}$$

where:

$$EDM = ED_{0-2} \times 10 + ED_{2-6} \times 3 + ED_{6-16} \times 3 + ED_{16-26} \times 1$$

Combined Ground Water Equation – Mutagenic Contaminants

$$C_{wat\ gw\text{-}m} = \frac{1}{\frac{1}{C_{wat\ ingestion-m}} + \frac{1}{C_{wat\ dermal-m}} + \frac{1}{C_{wat\ inhalation-m}}}$$

Trichloroethylene (TCE)

Ground Water Ingestion

$$C_{wat\ ingestion-ca-TCE}\ (\mu g / L) = \frac{TR_r \times AT_c \times 1000\,\mu g / mg}{EF_r \times [IFW_{adj} \times CAFo + IFWM_{adj} \times MAFo] \times SF_o}$$

where:

$$IFW_{adj} = \frac{ED_c \times IRW_c}{BW_c} + \frac{ED_r - ED_c \times IRW_a}{BW_a}$$

$$IFWM_{adj} = \frac{ED_{0-2} \times IFW_{child} \times ADAF_{0-2}}{BW_{child}} + \frac{ED_{2-6} \times IFW_{child} \times ADAF_{2-6}}{BW_{child}} + \frac{ED_{6-16} \times IFW_{adult} \times ADAF_{6-16}}{BW_{adult}} + \frac{ED_{16-30} \times IFW_{adult} \times ADAF_{16-30}}{BW_{adult}}$$

Ground Water Dermal Contact – TCE Carcinogenic/Mutagenic Risks

If ET ≤ t*, then:

$$C_{wat\ dermal-ca-TCE}\ (\mu g / L) = \frac{DA_{event} \times 1000 \frac{cm^3}{L}}{2 \times FA \times Kp \times \sqrt{\frac{6 \times \tau_{event} \times ET_b}{\Pi}}}$$

If ET > t*, then:

$$C_{wat\ dermal-ca-TCE}\ (\mu g/L) = \frac{DA_{event} \times 1000 \frac{cm^3}{L}}{FA \times Kp \times \left[\frac{ET_b}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]}$$

where:

$$DA_{event-TCE} = \frac{TR_r \times AT_c \times 1000 \frac{\mu g}{mg}}{\left(\frac{SFo}{ABS_{GI}} \right) \times EF_r \times (DFW_{adj} \times CAFo + DFWM_{adj} \times MAFo)}$$

$$DFW_{adj} = \frac{ED_c \times SA_c}{BW_c} + \frac{(ED_r - ED_c) \times SA_a}{BW_a}$$

$$DFWM_{adj} = \frac{ED_{0-2} \times SA_c \times 10}{BW_c} + \frac{ED_{2-6} \times SA_c \times 3}{BW_c} + \frac{ED_{6-16} \times SA_a \times 3}{BW_a} + \frac{ED_{16-26} \times SA_a \times 1}{BW_a}$$

Ground Water Inhalation-TCE Carcinogenic/Mutagenic Risks

$$C_{wat\ inhalation-ca-TCE}\ (\mu g/L) = \frac{TR_r \times AT_c}{EF_r \times (EDr \times CAFi + EDM \times MAFi) \times ET_r \times K \times CF_i \times IUR}$$

where:

$$EDM = ED_{0-2} \times 10 + ED_{2-6} \times 3 + ED_{6-16} \times 3 + ED_{16-26} \times 1$$

Vinyl Chloride

Ground Water Ingestion – Vinyl Chloride Risks

$$C_{wat\ ingestion-vc}\ (\mu g/L) = \frac{TR_r \times 1000\ \mu g/mg}{\left(\left(EF_r \times IFW_{adj} \times SF_o \right) \frac{1}{AT_c} \right) + \left(\frac{SF_o \times IRW_c}{BW_c} \right)}$$

Ground Water Dermal Contact – Vinyl Chloride Risks

If ET ≤ t*, then:

$$C_{wat\ dermal-ca-VC}\ (\mu g/L) = \frac{DA_{event} \times 1000 \frac{cm^3}{L}}{2 \times FA \times Kp \times \sqrt{\frac{6 \times \tau_{event} \times ET_b}{\Pi}}}$$

If ET > t*, then:

$$C_{wat\ dermal-ca-VC}\ (\mu g/L) = \frac{DA_{event} \times 1000 \frac{cm^3}{L}}{FA \times Kp \times \left[\frac{ET_b}{1+B} + 2 \times \tau_{event} \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]}$$

where:

$$DA_{event-VC} = \frac{TR_r \times AT_c \times 1000 \frac{\mu g}{mg}}{\left(\frac{SFo}{ABS_{GI}}\right) \times EF_r \times DFW_{adj}}$$

$$DFW_{adj} = \frac{ED_c \times SA_c}{BW_c} + \frac{(ED_r - ED_c) \times SA_a}{BW_a}$$

$$DFWM_{adj} = \frac{ED_{0-2} \times SA_c \times 10}{BW_c} + \frac{ED_{2-6} \times SA_c \times 3}{BW_c} + \frac{ED_{6-16} \times SA_a \times 3}{BW_a} + \frac{ED_{16-26} \times SA_a \times 1}{BW_a}$$

Ground Water Inhalation – Vinyl Chloride Risks

$$C_{wat\ inhalation-vc}\ (\mu g/L) = \frac{TR_r}{\left((EF_r \times ED_a \times ET_a \times K \times CF_i \times IUR) \times \frac{1}{AT_c}\right) + (IUR \times K)}$$

Combined Ground Water Equation – Vinyl Chloride

$$\frac{1}{\frac{1}{C_{wat\ ingestion-VC}} + \frac{1}{C_{wat\ dermal-VC}} + \frac{1}{C_{wat\ inhalation-VC}}}$$

SUPPORTING EQUATIONS

Soil-to-Air Volatilization Factor (VF_s)

Derivation of the Volatilization Factor

$$VF_s\,(m^3/kg) = Q/C\; x\; \frac{(3.14\,x\,D_A\,x\,T)^{1/2}}{(2\,x\,\rho_b\,x\,D_A)}\; x1E-04\,m^2/cm^2$$

Where:

$$D_A\,(cm^2/\sec) = \frac{[(\theta_a^{\,10/3}\;x\,D_i\,x\,H' + \theta_w^{\,10/3}\;x\,D_w)/n^2]}{\rho_b\,x\,K_d + \theta_w + \theta_a\,x\,H'}$$

Where:

Parameter	Definition	Units	Default Value
D_A	Apparent diffusivity	cm^2/sec	Chemical-specific (calculated)
D_i	Diffusivity in air	cm^2/sec	Chemical-specific
D_w	Diffusivity in water	cm^2/sec	Chemical-specific
f_{oc}	Fraction organic carbon in soil	g/g	0.006 (0.6%)
H	Henry's Law Constant	atm-m^3/mole	Chemical-specific
H'	Dimensionless Henry's Law Constant, = H x 41	unitless	Chemical-specific (calculated)
K_d	Soil-water partition coefficient, = K_{oc} x f_{oc}	cm^3/g	Chemical-specific (calculated for organics)
K_{oc}	Soil-organic carbon-water partition coefficient	cm^3/g	Chemical-specific
n	Total soil porosity	(L_{pore}/L_{soil})	0.43 or 1-(ρ_b/ρ_s)
Q/C	Inverse of the mean contaminant conc. at the center of a 0.5-acre square source	g/m^2-sec/kg-m^3	81.64 (value for Lincoln, NE)
T	Exposure interval	sec	9.5E+08
VF_s	Volatilization factor	m^3/kg	Chemical-specific (calculated)
θ_a	Air-filled soil porosity	(L_{air}/L_{soil})	0.28 or n-θ_w
θ_w	Water-filled soil porosity	(L_{water}/L_{soil})	0.15
ρ_b	Dry soil bulk density	g/cm^3	1.5
ρ_s	Soil particle density	g/cm^3	2.65

Soil-to-Air Particulate Emission Factor (PEF)

Derivation of the Particulate Emission Factor

$$PEF\ m^3/kg = Q/C\ x\left(\frac{[3600\ \text{sec}/hr]}{[0.036\ x\ (1-V)\ x\ (U_m/U_t)^3\ x\ F(x)]}\right)$$

Where:

Parameter	Definition	Units	Default Value
F(x)	Function dependent on U_m/U_t derived using Cowherd and others (1985)	unitless	0.194
PEF	Particulate emission factor	m3/kg	1.2E+09 (calculated)
Q/C	Inverse of the mean contaminant conc. at the center of a 0.5-acre square source	g/m^2-sec/kg-m^3	81.64 (value for Lincoln, NE)
U_m	Mean annual windspeed	m/sec	4.69
U_t	Equivalent threshold value of windspeed at 7 m	m/sec	11.32
V	Fraction of vegetative cover	unitless	0.5

Soil Saturation Concentration (sat)

Derivation of the Soil Saturation Limit

$$sat = \frac{S}{\rho_b}\ x\ (K_d\ x\ \rho_b + \theta_w + H'\ x\ \theta_a)$$

Where:

Parameter	Definition	Units	Default Value
sat	Soil saturation concentration	mg/kg	Chemical-specific (calculated)
S	Solubility in water	mg/L-water	Chemical-specific
ρ_b	Dry soil bulk density	kg/L	1.5
n	Total soil porosity	L_{pore}/L_{soil}	0.43 or 1-ρ_b/ρ_s
ρ_s	Soil particle density	kg/L	2.65
K_d	Soil-water partition coefficient, = K_{oc} x f_{oc}	L/kg	Chemical-specific (calculated for organics)
K_{oc}	Soil-organic carbon-water partition coefficient	L/kg	Chemical-specific
f_{oc}	Fraction organic carbon content of soil	g/g	0.006 (0.6%)
θ_w	Water-filled soil porosity	L_{water}/L_{soil}	0.15
θ_a	Air-filled soil porosity	L_{air}/Ls_{oil}	0.28 or n-θ_w
w	Average soil moisture content	kg_{water}/kg_{soil} or L_{water}/kg_{soil}	0.1
H	Henry's Law Constant	atm-m^3/mole	Chemical-specific
H'	Dimensionless Henry's Law Constant, = H x 41	unitless	Chemical-specific (calculated)

Soil-to-Ground Water RG

Derivation of the Soil-to-Ground water RG

$$RG(mg/kg) = C_w \; x \; DAF \; x [K_d + \frac{(\theta_w + \theta_a \; x \; H')}{\rho_b}]$$

Where:

Parameter	Definition	Units	Default Value
C_w	Target soil leachate concentration	mg/L	Chemical-specific (MCL, or calculated ground water combined value if no MCL available)
DAF	Dilution attenuation factor	unitless	20
f_{oc}	Fraction organic carbon content of soil	g/g	0.002 (0.2%)
H	Henry's Law Constant	atm-m^3/mole	Chemical-specific
H'	Dimensionless Henry's Law Constant = H x 41	unitless	Chemical-specific (calculated)
K_d	Soil-organic carbon/water partition coefficient, = K_{oc} x f_{oc}	L/kg	Chemical-specific (calculated for organics)
n	Total soil porosity	L_{pore}/L_{soil}	0.43 or $1-\rho_b/\rho_s$
θ_a	Air-filled soil porosity	L_{air}/Ls_{oil}	0.13 or $n-\theta_w$
θ_w	Water-filled soil porosity	L_{water}/L_{soil}	0.3
ρ_b	Dry soil bulk density	kg/L	1.5
ρ_s	Soil particle density	kg/L	2.65

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TABLE C-1

STANDARD DEFAULT FACTORS

Symbol	Definition	Units	Default Value	Reference
ABS_d	Dermal absorption factors	unitless	Chemical-specific	RAGS (Part E), U.S. EPA 2004
AF_{a-r}	Adherence factor for soils, adult resident	mg/cm^2	0.07	RAGS (Part E), U.S. EPA 2004
AF_{a-w}	Adherence factor for soils, adult worker	mg/cm^2	0.2	RAGS (Part E), U.S. EPA 2004
AF_c	Adherence factor for soils, child	mg/cm^2	0.2	RAGS (Part E), U.S. EPA 2004
AT_c	Averaging time, carcinogens	days	25,550	RAGS (Part A), U.S. EPA 1989
AT_n	Averaging time, noncarcinogens	days	ED x 365	RAGS (Part A), U.S. EPA 1989
BW_a	Body weight, adult	kg	80	Exposure Factors, U.S. EPA 2014
BW_c	Body weight, child	kg	15	Exposure Factors, U.S. EPA 2014
CAFi	Cancer Adjustment Factor – inhalation	unitless	0.756	EPA 2017
CAFo	Cancer Adjustment Factor - oral	unitless	0.804	EPA 2017
DFS_{adj}	Age-adjusted dermal factor – soil	mg-year/kg-day	295 (calculated)	U.S. EPA 2005
$DFSM_{adj}$	Age-adjusted dermal factor – soil, mutagenic	mg-year/kg-day	1,224 (calculated)	U.S. EPA 2005
DFW_{adj}	Age-adjusted dermal factor – water	events-cm^2/kg	7,459 (calculated)	U.S. EPA 2005
$DFWM_{adj}$	Age-adjusted dermal factor – water, mutagenic	events-cm^2/kg	23,405 (calculated)	U.S. EPA 2005
ED_c	Exposure duration, child	years	6	Exposure Factors, U.S. EPA 2014
ED_a	Exposure duration, adult resident	years	20 [a]	Exposure Factors, U.S. EPA 2014
EDM	Exposure duration, age-adjusted for mutagenic compounds	years	72	U.S. EPA 2005
ED_w	Exposure duration, industrial	years	25	Exposure Factors, U.S. EPA 2014
EF_r	Exposure frequency, residential	days/year	350	Exposure Factors, U.S. EPA 2014
EF_w	Exposure frequency, industrial	days/year	250	Exposure Factors, U.S. EPA 2014
ET_r	Exposure Time, residential	hours/day	24	Exposure Factors, U.S. EPA 2014
ET_w	Exposure Time, worker	hours/day	8	Exposure Factors, U.S. EPA 2014
ETb_{adj}	Exposure time, bathing - age-adjusted.	hours/event	0.67	Exposure Factors, U.S. EPA 2014
ETb_{a-r}	Exposure time, bathing - adult resident	hours/day	0.54	Exposure Factors, U.S. EPA 2014
ETb_{a-c}	Exposure time, bathing - child resident	hours/day	0.71	Exposure Factors, U.S. EPA 2014
EV	Event frequency	Events per day	1	Exposure Factors, U.S. EPA 2014
IFS_{adj}	Age-adjusted soil ingestion factor	mg-year/kg-day	105 (calculated)	U.S. EPA 2005
$IFSM_{adj}$	Age-adjusted soil ingestion factor - mutagenic	mg-year/kg-day	477 (calculated)	U.S. EPA 2005
IFW_{adj}	Age-adjusted water ingestion factor	L-year/kg-day	0.94 (calculated)	U.S. EPA 2005

TABLE C-1 (Continued)

STANDARD DEFAULT FACTORS

Symbol	Definition	Units	Default Value	Reference
$IFWM_{adj}$	Age-adjusted water ingestion factor - mutagenic	L-year/kg-day	2.91 (calculated)	U.S. EPA 2005
IRS_a	Soil ingestion rate, adult	mg/day	100	Exposure Factors, U.S. EPA 2014
IRS_c	Soil ingestion rate, child	mg/day	200	Exposure Factors, U.S. EPA 2014
IRS_w	Soil ingestion rate, industrial	mg/day	100	Soil Screening Guidance, U.S. EPA 2002
IRW_a	Drinking water ingestion rate, adult	L/day	2.5	Exposure Factors, U.S. EPA 2014
IRW_c	Drinking water ingestion rate, child	L/day	0.78	Exposure Factors, U.S. EPA 2014
IUR	Inhalation unit risk factor	$(\mu g/m^3)^{-1}$	Chemical-specific	EPA 2017
K	Volatilization factor for water (Andelman Volatilization Factor)	L/m^3	0.5	RAGS (Part B), U.S. EPA 1991
MAFi	Mutagenic adjustment factor - inhalation	unitless	0.244	EPA 2017
MAFo	Mutagenic adjustment factor - oral	unitless	0.202	EPA 2017
PEF	Particulate emission factor	m^3/kg	2.0E+09 (calculated)	Soil Screening Guidance, U.S. EPA 1996a; and 1996b
RfC	Inhalation reference concentration	mg/m^3	Chemical-specific	EPA 2017
RfD_o	Reference dose, oral	mg/kg-day	Chemical-specific	EPA 2017
SA_{a-r}	Exposed surface area for soil/dust, adult resident	cm^2/day	6,032	Exposure Factors, U.S. EPA 2014
SA_{a-w}	Exposed surface area for soil/dust, adult worker	cm^2/day	2,690	Exposure Factors, U.S. EPA 2014
SA_c	Exposed surface area for child in soil	cm^2/day	2,373	Exposure Factors, U.S. EPA 2014
Sat	Soil saturation concentration	mg/kg	Chemical-specific	Soil Screening Guidance, U.S. EPA 1996a; and 1996b
SF_o	Oral cancer slope factor	$(mg/kg\text{-}day)^{-1}$	Chemical-specific	EPA 2017
THQ_r	Target hazard quotient, residential	unitless	0.25	Nebraska Department of Environmental Quality
THQ_w	Target hazard quotient, industrial	unitless	1	Nebraska Department of Environmental Quality
TR_r	Target cancer risk, residential	unitless	1E-06	Nebraska Department of Environmental Quality
TR_w	Target cancer risk, industrial	unitless	1E-05	Nebraska Department of Environmental Quality
VF_s	Volatilization factor for soil	m^3/kg	Chemical-specific	Soil Screening Guidance, U.S. EPA 1996a; 1996b

TABLE C-1 (Continued)

STANDARD DEFAULT FACTORS

Footnotes:

[a] Exposure duration for lifetime residents is assumed to be 26 years total. For carcinogens, exposures are combined for children (6 years) and adults (20 years).

cm^2/day	square centimeters per day
kg	kilogram
L/day	liter per day
L/m^3	liter per cubic meter
m^3-year/kg-day	cubic meter year per kilogram per day
m^3/day	cubic meter per day
m^3/kg	cubic meter per kilogram
mg/cm^3	milligram per cubic centimeter
mg/day	milligram per day
mg/kg	milligram per kilogram
mg/kg-day	milligram per kilogram body weight per day
mg/m^3	milligram per cubic meter
mg-year/kg-day	milligram year per kilogram per day
µg/m^3	microgram per cubic meter

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ATTACHMENT D

APPROACH FOR THE DEVELOPMENT OF REMEDIATION GOALS FOR THE VAPOR INTRUSION TO INDOOR AIR EXPOSURE PATHWAY

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ATTACHMENT D

APPROACH FOR THE DEVELOPMENT OF NDEQ VCP REMEDIATION GOALS FOR THE VAPOR INTRUSION TO INDOOR AIR EXPOSURE PATHWAY

CONTENTS

ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
COPC	Chemical of potential concern
Hg	Mercury
NDEQ	Nebraska Department of Environmental Quality
OSHA	Occupational Safety and Health Administration
mm	Millimeter
U.S. EPA	U.S. Environmental Protection Agency
VCP	Voluntary Cleanup Program
VISL	Vapor Intrusion Screening Levels

APPROACH FOR THE DEVELOPMENT OF NDEQ VCP REMEDIATION GOALS FOR THE VAPOR INTRUSION TO INDOOR AIR EXPOSURE PATHWAY

1.0 INTRODUCTION

The Nebraska Department of Environmental Quality (NDEQ) Voluntary Cleanup Program (VCP) has developed remediation goals for soil and groundwater exposures to residents and commercial/industrial receptors via ingestion, dermal contact, and inhalation of outdoor dust and vapors; however, these remediation goals do not include the potential impacts of vapor intrusion to indoor air from soil or groundwater. This attachment presents the methodology for estimating concentrations of chemicals of potential concern (COPC) in indoor air from impacted soil or groundwater by vapor intrusion. Volatile contamination in a source medium (such as soil or groundwater) can migrate to other environmental media by volatilization, diffusion, or advection. For example, volatile organic compounds in soil can vaporize into soil gas and migrate into indoor air (through cracks in a building's foundation). NDEQ has developed remediation goals for volatile COPCs in soil gas and groundwater that would be protective for human receptors exposed via vapor intrusion to indoor air.

Several approaches were considered in developing remediation goals protective for human receptors possibly vulnerable to vapor intrusion to indoor air. One approach would be to develop remediation goals for soils and groundwater that would be protective for this pathway. However, current U.S. Environmental Protection Agency (U.S. EPA) guidance does not recommend using soil data to evaluate vapor intrusion to indoor air (U.S. EPA 2015). U.S. EPA notes concerns with how the data would be obtained and the number of variables that would impact volatilization of compounds from a soil matrix to soil gas followed by migration to indoor air. U.S. EPA recommends use of only soil gas or groundwater data to estimate indoor air concentrations for the vapor intrusion pathway. Therefore, the NDEQ VCP approach assumes U.S. EPA's position and develops vapor intrusion-based remediation goals for soil gas and groundwater media.

To develop remediation goals for this pathway, U.S. EPA's Vapor Intrusion Screening Level (VISL) calculator (U.S. EPA 2017a), Version 3.5 updated to 2018 toxicity values (U.S. EPA 2018) is used to estimate concentrations of volatile COPCs in soil gas and groundwater that would result in indoor air concentrations equivalent to the target cancer risk or noncancer hazard.

The VISL is based on the Johnson and Ettinger (1991) vapor intrusion model and uses a standard set of default parameters for the calculations. The Johnson and Ettinger model is a one-dimensional model that estimates convective and diffusive transport of chemical vapors emanating from groundwater and soil gas into indoor spaces located directly above or near the source of contamination. A detailed description of the vapor intrusion model is provided in "Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)" (U.S. EPA 2015). The VISL calculator incorporates simplifying assumptions into the Johnson and Ettinger model regarding the distribution and occurrence of chemicals, subsurface characteristics, transport mechanisms, and building construction.

1.1 INDOOR AIR MIGRATION PATHWAY AND MODELING ANALYSES

The subsurface target concentrations in the VISL Calculator (U.S. EPA 2017a) are based on the generic conceptual model for vapor intrusion described in U.S. EPA's vapor intrusion guidance (2015). This conceptual model assumes a groundwater or vadose zone source of volatile vapors that diffuse upwards through unsaturated soils towards the surface and into buildings. In this model, the soil in the vadose zone is considered to be relatively homogeneous and isotropic. The receptors are assumed to be occupants in buildings with poured concrete foundations (for example, basement or slab on grade foundations or crawlspaces without a liner or other vapor barrier). The underlying assumption for this generic model is that contaminant vapor concentrations will tend to reduce or attenuate in the subsurface as vapors migrate upward from the source through dispersive mechanisms and that site-specific building characteristics will tend to further dilute the vapors as they mix with the air in the building.

Remediation goals for vapor intrusion are limited to volatile chemicals. Volatile chemicals are identified using the definition of volatility (vapor pressure is greater than 1 millimeter of mercury (mm Hg), or Henry's Law constant greater than 1×10^{-5} atmosphere-cubic meter per mole) adopted from U.S. EPA (2015). The chemicals that meet the volatile definition are identified in Attachment B of the Remediation Goals Protocol, Table B-2, noted with a "1" in the VOL column. The model incorporates chemical-specific fate and transport values as needed.

Consistent with the current remediation goals, the vapor intrusion goals are calculated using exposure factors established in the VCP guidance and based on standard target excess cancer risks and hazards indices (residential—1E-06 and 0.25, and commercial/industrial—1 E-05 and 1). There are chemicals for

which toxicity values are not provided due to U.S. EPA guidance (2017b) indicating the current opinion that route-to-route extrapolation of toxicity data is not appropriate, and that those chemicals for which no values are provided have no viable toxicity data for the inhalation exposure route. If there is a specific volatile chemical present at a VCP site for which no toxicity data is available, either a Tier 3 assessment could be performed or a proposed remediation goal could be calculated using U.S. EPA vapor intrusion guidance (2015), with an inhalation toxicity value reviewed and ultimately approved by the NDEQ.

1.2 RECEPTORS

The VCP soil remediation goals are developed for residential and industrial/commercial receptors, while groundwater remediation goals are developed for residents only. Consistent with the soil remediation goals, the vapor intrusion goals are developed for both residential and industrial/commercial receptors. Current U.S. EPA (2015) guidance acknowledges the potential inconsistency between U.S. EPA and Occupational Safety and Health Administration (OSHA) goals for worker exposure. However, workers in an office setting are not covered by OSHA and these values would be appropriate.

2.0 VAPOR INTRUSION INPUT PARAMETERS

Volatilization of contaminants located in soil and groundwater, and the subsequent mass transport of these vapors into indoor spaces, constitute a potential inhalation exposure pathway evaluated through risk assessment. Johnson and Ettinger (1991) introduced a screening-level model that incorporates both convective and diffusive mechanisms for estimating the transport of contaminant vapors emanating from soil and groundwater into indoor spaces located directly above or in close proximity to the source of contamination.

2.1 VAPOR INTRUSION MODEL

The vapor intrusion model provides an estimated attenuation coefficient that relates the vapor concentration in the indoor space to the vapor concentration at the source of contamination. The model for soil gas and groundwater is constructed as a steady-state solution to vapor transport (infinite or nondiminishing source). Air emissions and transport of volatile COPCs from soil gas or groundwater to indoor air, and thus inputs to the model, are based on chemical properties of the contaminant and appropriate exposure assumptions for those receptors under evaluation (U.S. EPA 2015). The model also incorporates default fate and transport chemical parameters such as vapor pressure and Henry's Law constants. Additionally, the model incorporates inhalation toxicity factors selected based on U.S. EPA hierarchy (U.S. EPA 2003) and consistent with the toxicity values used in the Regional Screening Levels (U.S. EPA 2018).

Sub-Slab and Exterior Soil Gas

The VCP RGs for sub-slab and exterior soil gas concentrations that would be protective for indoor air are calculated by dividing the acceptable indoor air concentration by EPA's generic attenuation factor of 0.03 (EPA 2015) using the following equation.

$$C_{soil-gas} = \frac{C_{target,ia}}{AF_{ss}}$$

Where:

$C_{soil\text{-}gas}$ = Target soil gas concentration (microgram per cubic meter [µg/m^3])

$C_{target.is}$ = Target indoor air concentrations (µg/m^3)

AF_{ss} = Attenuation factor (ratio of indoor air concentration to sub-slab or soil gas concentration; default value is 0.03)

Groundwater

The VCP RGs for groundwater corresponding to a chemical's target indoor air concentration are calculated by dividing the target indoor air concentration by an attenuation factor of 0.001 (EPA 2015) and then converting the vapor concentration to an equivalent groundwater concentration. This assumes there is equilibrium between the groundwater and the vapor phase at the water table and this equilibrium obeys Henry's Law. The following equations were used.

$$C_{gw} = \frac{C_{target.ia}}{HLC \times AF_{gw} \times \left(\frac{1000\ L}{m^3}\right)}$$

Where:

C_{gw} = Target groundwater concentration (micrograms per liter [µg/L])

$C_{target,ia}$ = Target indoor air concentration (µg/m^3)

AF_{gw} = Attenuation factor (ratio of indoor air concentration to groundwater concentration; default value is 0.001)

HLC = Dimensionless Henry's Law Constant at the specified groundwater temperature [(milligrams per liter [mg/L] – vapor/mg/L – H_2O)]

2.2 SOIL AND GROUNDWATER PROPERTIES

Because remediation goals are to be developed for the entire State, the most health-protective assumptions should be used. The model also assumes homogeneous soil stratigraphy from the soil surface to the top of contamination for modeling indoor air concentrations and the model defaults to the most conservative soil type - sand.

Contaminants in groundwater can become sources for vapor intrusion if they are likely to volatilize under normal temperature and pressure conditions. Water solubility is also a factor for chemicals in source zones that come into contact with migrating groundwater. Common classes of chemicals of concern for vapor intrusion that exhibit these characteristics are volatile organic compounds (VOC), such as tetrachloroethylene (PCE), trichloroethylene (TCE), vinyl chloride, carbon tetrachloride, and benzene, toluene, ethylbenzene and xylenes (collectively, BTEX). Other compounds that are not as volatile as these VOCs (e.g., so-called semi-volatile organic compounds), but that may be cause for concern, include some polycyclic aromatic hydrocarbons (PAHs) (e.g., naphthalene), some polychlorinated biphenyl (PCB) congeners, and elemental mercury.

Migration of chemicals through soil depends on the ability of chemicals to diffuse from the source into the vapor space and through the soil. Vapor space is a function of the total porosity of soil and the volume of water displacing air within the pore volume. The average soil gas and groundwater temperature (11 degrees Celsius [°C]) used in the model is based on the information provided by the U.S. Geological Survey (USGS 1925).

2.3 BUILDING PARAMETERS

This evaluation is based on buildings with either a slab-on-grade construction or a basement, again the distance from the base of the foundation is fixed. The model assumes that the contaminant source is infinite (with respect to modeling time of interest) and vapor infiltration is through cracks in the foundation and below-grade walls, if any (U.S. EPA 2015). The default attenuation factors for soil gas and groundwater assume generic building construction and vapor intrusion pathways.

3.0 SUMMARY AND CONCLUSIONS

This document outlines the approach for developing remediation goals for vapor intrusion to indoor air in both residential and commercial/industrial buildings, assuming sand above the source of soil gas or contaminated groundwater. These are generally considered conservative assumptions. The results for the calculation of the soil gas remediation goals are presented in Attachment A, Table A-2. In addition, Attachment B, Table B-5 provides calculation of acceptable indoor air concentrations, calculation of soil gas values and the groundwater remediation goals for the protection of indoor air.

4.0 REFERENCES

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ATTACHMENT E

TARGET ORGANS FOR NONCARCINOGENIC EFFECTS OF VARIOUS CONTAMINANTS

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ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
1,1,1,2-Tetrachloroethane	630-20-6	Hepatic, Urinary	--
1,1,1-Trichloroethane	71-55-6	Body Weight	Hepatic, Nervous
1,1,2,2-Tetrachloroethane	79-34-5	Hepatic	--
1,1,2-Trichloroethane	79-00-5	Immune, Hematologic	Respiratory
1,1,2-Trichloropropane	598-77-6	Endocrine, Hepatic, Urinary	--
1,1-Biphenyl	92-52-4	Urinary	Respiratory, Hepatic, Urinary
1,1-Dichloroethane	75-34-3	Nervous	--
1,1-Dichloroethylene	75-35-4	Hepatic	Hepatic
1,1-Difluoroethane	75-37-6	--	None
1,1'-Sulfonylbis (4-Chlorobenzene)	80-07-9	Hepatic,	--
1,2,3-Trichloropropane	96-18-4	Hepatic	Lymphatic
1,2,3-Trichloropropene	96-19-5	Body Weight,	Respiratory
1,2,4,5-Tetrachlorobenzene	95-94-3	Urinary	--
1,2,4-Tribromobenzene	615-54-3	Hepatic,	--
1,2,4-Trichlorobenzene	120-82-1	Endocrine	Urinary, Hepatic
1,2,4-Trimethylbenzene	95-63-6	Nervous	Nervous
1,2-Dibromo-3-chloropropane	96-12-8	Reproductive	Reproductive
1,2-Dibromoethane	106-93-4	Endocrine, Reproductive, Hepatic	Respiratory
1,2-Dichlorobenzene	95-50-1	Body Weight	Body Weight
1,2-Dichloroethane	107-06-2	Urinary	Nervous
1,2-Dichloroethylene (cis)	156-59-2	Urinary, Whole Body	--
1,2-Dichloroethylene (trans)	156-60-5	Immune	--
1,2-Dichloropropane	78-87-5	Hepatic, Hematologic, Nervous, Respiratory,	Respiratory
1,2-Dinitrobenzene	528-29-0	Immune	--
1,2-Epoxybutane	106-88-7	--	Respiratory
1,3,5-Trimethylbenzene	108-67-8	Nervous	Nervous
1,3-Butadiene	106-99-0	--	Reproductive
1,3-Dichloropropene	542-75-6	Gastrointestinal	Respiratory
1,3-Dinitrobenzene	99-65-0	Immune	--
1,4-Dibromobenzene	106-37-6	Hepatic	--
1,4-Dichlorobenzene	106-46-7	Dermal, Developmental, Hepatic, Ocular, Urinary	Hepatic
1,4-Dinitrobenzene	100-25-4	Immune	--
1,4-Dioxane	123-91-1	Hepatic, Urinary	Nervous, Respiratory
1,4-Dithiane	505-29-3	Nervous, Respiratory	--
1,6-Hexamethylene diisocyanate	822-06-0	--	Nervous, Respiratory
1-Butanol	71-36-3	Nervous	--
1-Chloro-1,1-difluoroethane	75-68-3	--	No Adverse Effects
1-Chlorobutane	109-69-3	Nervous	--
2-(2,4,5-Trichlorophenoxy)propionic acid	93-72-1	Hepatic	--
2-(2-Methyl-4-chlorophenoxy) propionic acid	93-65-2	Urinary	--
2,3,4,6-Tetrachlorophenol	58-90-2	Hepatic	--
2,3,7,8-TCDD (Dioxin)	1746-01-6	Reproductive, Developmental, Endocrine	Hepatic, Reproductive, Developmental, Endocrine, Respiratory, Hematologic

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
2,3-Dichloropropanol	616-23-9	Urinary, Developmental	--
2,4,5-Trichlorophenol	95-95-4	Hepatic, Urinary	--
2,4,5-Trichlorophenoxyacetic acid	93-76-5	Urinary	--
2,4,6-Trichloroaniline	634-93-5	Hematologic, Reproductive	--
2,4,6-Trichlorophenol	88-06-2	Reproductive	--
2,4,6-Trinitrotoluene	118-96-7	Hepatic	--
2,4-D	94-75-7	Hematologic, Hepatic, Urinary	--
2,4-DB	94-82-6	Urinary, Hepatic	--
2,4-Dichlorophenol	120-83-2	Immune	--
2,4-Dimethylaniline	95-68-1		
2,4-Dimethylphenol	105-67-9	Nervous, Hematologic	--
2,4-Dinitrotoluene	121-14-2	Nervous, Hepatic, Hematologic	--
2,6-Dimethylphenol	576-26-1	Immune, Hepatic, Urinary, Body Weight	--
2,6-Dinitrotoluene	606-20-2	Immune	--
2-Chloro-1,3-butadiene	126-99-8	Dermal, Body Weight	--
2-Chloroacetophenone	532-27-4	Body Weight, Developmental	Developmental, Skeletal
2-Chlorophenol	95-57-8	Reproductive	--
2-Ethoxyethanol	110-80-5	Reproductive	Reproductive, Hematologic
2-Ethoxyethanol acetate	111-15-9	Reproductive	Developmental
2-Methoxyethanol	109-86-4	Reproductive	Reproductive
2-Methoxyethanol acetate	110-49-6	Reproductive	Reproductive
2-Methyl-5-nitroaniline	99-55-8	Body Weight, Hematologic	--
2-Methylphenol	95-48-7	Nervous, Body Weight	Nervous
2-Nitroaniline	88-74-4	Body Weight, Hematologic	Respiratory
2-Nitropropane	79-46-9	--	Hepatic
3,4-Dimethylphenol	95-65-8	Immune, Hepatic, Urinary, Cardiovascular, Body Weight	--
3-Methylphenol	108-39-4	Nervous, Body Weight	Nervous
4,4'-Dichlorobenzophenone	90-98-2	No Adverse Effect	--
4,4'-Methylene bis(2-chloroaniline)	101-14-4	Hepatic	--
4,4'-Methylenebisbenzeneamine	101-77-9	--	Ocular, Hepatic
4,4'-Methylenediphenyl isocyanate	101-68-8	--	Nervous, Respiratory
4,6-Dinitro-o-cyclohexyl phenol	131-89-5	Ocular	--
4-Chloroaniline	106-47-8	Immune	--
4-Chlorobenzotrifluoride	98-56-6	Hepatic, Urinary, , ,	Hepatic
4-Methylphenol	106-44-5	Dermal, Nervous, Respiratory	Nervous
Acephate	30560-19-1	Nervous	--
Acenaphthene	83-32-9	Hepatic	--
Acetaldehyde	75-07-0	--	Nervous, Respiratory
Acetochlor	34256-82-1	Hematologic, Hepatic, Nervous, Reproductive, Urinary	--
Acetone	67-64-1	Urinary	Hematologic, Nervous
Acetone cyanohydrin	75-86-5	--	Respiratory
Acetonitrile	75-05-8	--	Whole Body
Acrolein	107-02-8	Whole Body	Respiratory

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
Acrylamide	79-06-1	Nervous	Nervous
Acrylic acid	79-10-7	Developmental	Nervous, Respiratory
Acrylonitrile	107-13-1	Developmental, Hematologic, Nervous, Reproductive	Respiratory
Alachlor	15972-60-8	Hematologic	--
Alar	1596-84-5	No Adverse Effect	--
Aldicarb	116-06-3	Nervous	--
Aldicarb sulfone	1646-88-4	Nervous	--
Aldrin	309-00-2	Hepatic	--
Ally	74223-64-6	Body Weight	--
Allyl alcohol	107-18-6	Hepatic, Urinary	Body Weight
Allyl chloride	107-05-1	--	Nervous
Aluminum	7429-90-5	Nervous, Developmental	Nervous
Aluminum phosphide	20859-73-8	Body Weight	--
Amdro	67485-29-4	Organ Weight	--
Ametryn	834-12-8	Hepatic	--
Amitraz	33089-61-1	Hematologic	--
Ammonia	7664-41-7	--	Respiratory
Ammonium sulfamate	7773-06-0	Body Weight	--
Aniline	62-53-3	Hematologic, Immune	Immune
Antimony and compounds	7440-36-0	Hematologic, Whole Body	--
Antimony pentoxide	1314-60-9	Whole Body, Hematologic	--
Antimony potassium tartrate	28300-74-5	Whole Body, Hematologic	--
Antimony tetroxide	1332-81-6	Whole Body, Hematologic	--
Antimony trioxide	1309-64-4	--	Respiratory
Apollo	74115-24-5	Endocrine, Hepatic	--
Aramite	140-57-8	Hepatic	--
Aroclor 1016	12674-11-2	Developmental	Developmental
Aroclor 1254	11097-69-1	Dermal, Immune, Ocular	--
Arsenic (inorganic)+++	7440-38-2	Cardiovascular, Dermal	Reproductive, Developmental, Cardiovascular, Nervous
Arsine	7784-42-1	Reproductive, Developmental, Cardiovascular, Nervous	Hematologic, Immune
Assure	76578-14-8	Hepatic	--
Asulam	3337-71-1	Hepatic, Reproductive	--
Atrazine	1912-24-9	Body weight	--
Avermectin B1	65195-55-3	Developmental	--
Barium and compounds	7440-39-3	Urinary	Developmental
Baygon	114-26-1	Nervous	--
Bayleton	43121-43-3	Body Weight, Hematologic	--
Baythroid	68359-37-5	Urinary, Body weight	--
Benefin	1861-40-1	Hematologic	--
Benomyl	17804-35-2	Developmental	--
Bentazon	25057-89-0	Hematologic	--
Benzaldehyde	100-52-7	Gastrointestinal, Urinary	--
Benzene	71-43-2	Immune	Immune

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
Benzo(a)pyrene	50-32-8	Developmental, Immune, Reproductive	Developmental, Immune, Reproductive
Benzoic acid	65-85-0	No Adverse Effect	--
Benzyl alcohol	100-51-6	Nervous	--
Benzyl chloride	100-44-7	Cardiovascular	Respiratory
Beryllium and compounds	7440-41-7	Gastrointestinal	Immune, Respiratory
beta-Chloronaphthalene	91-58-7	Hepatic, Respiratory	--
Bidrin	141-66-2	Reproductive	--
Biphenthrin (Talstar)	82657-04-3	Nervous	--
Bis(2-chloro-1-methylethyl)ether	108-60-1	Hematologic	--
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	Hepatic	--
Bisphenol A	80-05-7	Body Weight	--
Boron	7440-42-8	Developmental	Respiratory
Boron trifluoride	7637-07-2	Urinary	Urinary
Bromate	15541-45-4	Urinary	--
Bromobenzene	108-86-1	Hepatic	Hepatic
Bromodichloromethane	75-27-4	Urinary	--
Bromoform (tribromomethane)	75-25-2	Hepatic	--
Bromomethane	74-83-9	Gastrointestinal	Nervous, Respiratory
Bromophos	2104-96-3	Hematologic, Hepatic	--
Bromoxynil	1689-84-5	Hepatic, Body weight	--
Bromoxynil octanoate	1689-99-2	Hepatic, Body weight	--
Butyl benzyl phthalate	85-68-7	Hepatic	--
Butylate	2008-41-5	Hepatic	--
Butylphthalyl butylglycolate	85-70-1	No Adverse Effect	--
Cacodylic acid	75-60-5	Dermal, Gastrointestinal, Hepatic, Nervous, Respiratory	--
Cadmium (Water)	7440-43-9	Urinary	--
Cadmium and compounds+++	7440-43-9	Urinary	Respiratory, Urinary
Caprolactam	105-60-2	Developmental	Ocular
Captafol	2425-06-1	Urinary	--
Captan	133-06-2	Body weight	--
Carbaryl	63-25-2	Hepatic, Urinary	--
Carbofuran	1563-66-2	Nervous, Reproductive	--
Carbon disulfide	75-15-0	Developmental	Nervous
Carbon tetrachloride	56-23-5	Hepatic	Hepatic
Carbosulfan	55285-14-8	Body Weight	--
Carboxin	5234-68-4	Body Weight, Organ Weight, Whole Body	--
Chloramben	133-90-4	Hepatic	--
Chlordane	12789-03-6	Hepatic	Hepatic
Chlorimuron-ethyl	90982-32-4	Hematologic	--
Chlorine	7782-50-5	No Adverse Effect	Respiratory
Chlorine dioxide	10049-04-4	Nervous, Developmental	Respiratory, Cardiovascular
Chlorobenzene	108-90-7	Hepatic	Urinary, Hepatic
Chlorobenzilate	510-15-6	Nervous, Body Weight	--

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
Chlorodifluoromethane	75-45-6	--	Endocrine, Urinary
Chloroethane	75-00-3	--	Developmental, Skeletal
Chloroform	67-66-3	Hepatic	Hepatic
Chloromethane	74-87-3	--	Nervous
Chlorothalonil	1897-45-6	Urinary	--
Chlorpropham	101-21-3	Hematologic, Hepatic, Immune, Urinary	--
Chlorpyrifos	2921-88-2	Nervous	--
Chlorpyrifos-methyl	5598-13-0	Reproductive, Hepatic	--
Chlorsulfuron	64902-72-3	Body Weight	--
Chlorthiophos	60238-56-4	No Adverse Effect	--
Chromium III	16065-83-1	No Adverse Effect	--
Chromium VI+++	18540-29-9	No Adverse Effect	Respiratory
Cobalt	7440-48-4	Endocrine	Respiratory
Copper and compounds	7440-50-8	Gastrointestinal	--
Crotonaldehyde	123-73-9	Gastrointestinal	--
Cumene (isopropylbenzene)	98-82-8	Urinary	Endocrine, Urinary
Cyanazine	21725-46-2	Body Weight, Hematologic	--
Cyanide (free)	57-12-5	Reproductive	Endocrine
Cyanide (hydrogen)	74-90-8	Reproductive	Endocrine
Cyanogen	460-19-5	Reproductive	--
Cyanogen bromide	506-68-3	Endocrine, Nervous, Body Weight	--
Cyanogen chloride	506-77-4	Endocrine, Nervous	--
Cyclohexane	110-82-7	--	Developmental
Cyclohexanone	108-94-1	Body weight	Respiratory, Nervous, Body Weight
Cyclohexylamine	108-91-8	Reproductive	--
Cyhalothrin/Karate	68085-85-8	Developmental	--
Cypermethrin	52315-07-8	Gastrointestinal	--
Cyromazine	66215-27-8	Hematologic	--
Dacthal	1861-32-1	Endocrine, Hepatic, Urinary, Respiratory, Ocular	--
Dalapon	75-99-0	Urinary, Organ Weight	--
Danitol	39515-41-8	Nervous	--
DDD	72-54-8	Hepatic	--
DDE	72-55-9	Hepatic	--
DDT	50-29-3	Hepatic	--
Decabromodiphenyl ether	1163-19-5	Nervous	--
Demeton	8065-48-3	Nervous	--
Di(2-ethylhexyl)adipate	103-23-1	Developmental, Hepatic, Urinary, Muscoskeletal, Body Weight	--
Diazinon	333-41-5	Nervous	--
Dibenzofuran	132-64-9	Body Weight, Organ Weight	--
Dibromochloromethane	124-48-1	Hepatic	--
Dibutyl phthalate	84-74-2	Whole Body	--
Dichlorodifluoromethane	75-71-8	Body Weight	Body Weight

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
Dichlorvos	62-73-7	Nervous	Nervous
Dicyclopentadiene	77-73-6	Developmental	Urinary
Dieldrin	60-57-1	Hepatic	--
Diethyl phthalate	84-66-2	Decreased Growth, Organ Weight	--
Diethylene glycol, monobutyl ether	112-34-5	Hematologic	Hepatic
Diethylene glycol, monoethyl ether	111-90-0	Hepatic, Urinary	Respiratory
Diethylformamide	617-84-5	Body Weight, Immune	--
Difenzoquat (Avenge)	43222-48-6	Body Weight	--
Diflubenzuron	35367-38-5	Hematologic	--
Diisopropyl methylphosphonate (DIMP)	1445-75-6	No Adverse Effect	--
Dimethipin	55290-64-7	Hepatic	--
Dimethoate	60-51-5	Nervous	--
Dimethyl terephthalate	120-61-6	Urinary	--
Dinitrotoluene mixture	25321-14-6	Hepatic, Hematologic, Developmental, Urinary	--
Dinoseb	88-85-7	Developmental	--
Dioxin (2,3,7,8-TCDD)	1746-01-6	Reproductive, Developmental, Endocrine	Hepatic, Reproductive, Developmental, Endocrine, Respiratory, Hematologic
Diphenamid	957-51-7	Hepatic	--
Diphenyl sulfone	127-63-9	Hepatic	--
Diphenylamine	122-39-4	Hepatic, Urinary	--
Diquat	85-00-7	Ocular	--
Disulfoton	298-04-4	Nervous	--
Diuron	330-54-1	Hematologic	--
Dodine	2439-10-3	Endocrine	--
Endosulfan	115-29-7	Body Weight, Urinary, Cardiovascular,	--
Endothall	145-73-3	Gastrointestinal	--
Endrin	72-20-8	Nervous, Hepatic	--
Epichlorohydrin	106-89-8	Gastrointestinal, Urinary, Reproductive	Respiratory
EPTC (S-Ethyl dipropylthiocarbamate)	759-94-4	Cardiovascular	--
Ethephon (2-chloroethyl phosphonic acid)	16672-87-0	Nervous	--
Ethion	563-12-2	Nervous	--
Ethyl acetate	141-78-6	Whole Body, Body Weight	Body Weight, Respiratory
Ethyl acrylate	140-88-5	Gastrointestinal	Respiratory
Ethyl chloride	75-00-3	--	Developmental, Musculoskeletal
Ethyl ether	60-29-7	Body Weight	--
Ethyl methacrylate	97-63-2	--	Body Weight, Developmental
Ethyl p-nitrophenyl phenylphosphorothioate	2104-64-5	Nervous	--
Ethylbenzene	100-41-4	Hepatic, Urinary	Developmental
Ethylene cyanohydrin	109-78-4	Body Weight	--
Ethylene diamine	107-15-3	Hepatic, Urinary	--
Ethylene glycol	107-21-1	Urinary	Respiratory, Urinary, Developmental
Ethylene glycol, monobutyl ether	111-76-2	Hematologic	Hematologic
Ethylene oxide	75-21-8	--	Nervous

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
Ethylene thiourea (ETU)	96-45-7	Endocrine	--
Ethylphthalyl ethyl glycolate	84-72-0	Urinary	--
Express	101200-48-0	Urinary	--
Fenamiphos	22224-92-6	Nervous	--
Fluometuron	2164-17-2	No Adverse Effect	--
Fluoranthene	206-44-0	Hepatic, Urinary	--
Fluorene	86-73-7	Hematologic	--
Fluoride	16984-48-8	Muscoskeletal, Gastrointestinal	Respiratory
Fluoridone	59756-60-4	Reproductive, Urinary, Ocular, Body Weight, Organ Weight	--
Flurprimidol	56425-91-3	Hepatic	--
Flutolanil	66332-96-5	Hepatic, Reproductive	--
Fluvalinate	69409-94-5	Dermal, Body Weight	--
Folpet	133-07-3	Hepatic	--
Fomesafen	72178-02-0	Hepatic	--
Fonofos	944-22-9	Nervous, Hepatic	--
Formaldehyde	50-00-0	Urinary, Gastrointestinal, Body Weight	Respiratory
Formic acid	64-18-6	Reproductive, Developmental, Body Weight	Respiratory
Fosetyl-al	39148-24-8	Reproductive	--
Freon 113	76-13-1	Nervous	Body Weight, Nervous
Furan	110-00-9	Hepatic	--
Furfural	98-01-1	Hepatic	Respiratory
Glufosinate-ammonium	77182-82-2	Urinary	--
Glycidaldehyde	765-34-4	Endocrine, Urinary, Hematologic, Body Weight	Body Weight, Urinary
Glyphosate	1071-83-6	Developmental, Urinary	--
Haloxyfop-methyl	69806-40-2	Reproductive, Urinary	--
Harmony	79277-27-3	Body Weight	--
HCH (alpha)	319-84-6	Hepatic, Immune, Neurological	--
HCH (gamma) Lindane	58-89-9	Hepatic, Urinary	--
Heptachlor	76-44-8	Hepatic	--
Heptachlor epoxide	1024-57-3	Hepatic	--
Hexabromobenzene	87-82-1	Hepatic	--
Hexachlorobenzene	118-74-1	Hepatic	--
Hexachlorobutadiene	87-68-3	Urinary	--
Hexachlorocyclopentadiene	77-47-4	Gastrointestinal	Respiratory
Hexachloroethane	67-72-1	Urinary	Nervous
Hexachlorophene	70-30-4	Nervous	Gastrointestinal
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	Reproductive	--
Hexazinone	51235-04-2	Body Weight	--
HMX	2691-41-0	Hepatic	--
Hydrazine, dimethyl	57-14-7	Ocular	Reproductive
Hydrazine, hydrazine sulfate	302-01-2	--	Hepatic
Hydrogen chloride	7647-01-0	--	Respiratory
Hydrogen sulfide	7783-06-4	--	Nervous, Respiratory

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
Imazalil	35554-44-0	Body Weight	--
Imazaquin	81335-37-7	Immune, Hepatic, Hematologic, Body Weight	--
Iprodione	36734-19-7	Reproductive, Hematologic	--
Iron	7439-89-6	Gastrointestinal	--
Isobutanol	78-83-1	Nervous	--
Isophorone	78-59-1	Urinary	Developmental, Hepatic
Isopropalin	33820-53-0	Hematologic, Organ Weight	--
Isopropyl methyl phosphonic acid	1832-54-8	No Adverse Effect	--
Isoxaben	82558-50-7	Hepatic, Urinary, Cardiovascular	--
Kepone	143-50-0	Urinary	--
Lactofen	77501-63-4	Hepatic	--
Lead (tetraethyl)	78-00-2	Immune, Hepatic	--
Linuron	330-55-2	Hematologic	--
Lithium	7439-93-2	Urinary	--
Londax	83055-99-6	Hepatic	--
Malathion	121-75-5	Nervous	--
Maleic anhydride	108-31-6	Urinary	Respiratory
Maleic hydrazide	123-33-1	Urinary	--
Malononitrile	109-77-3	Hepatic, Immune	--
m-Aminophenol	591-27-5	Hematologic, Endocrine	--
Mancozeb	8018-01-7	Endocrine	--
Maneb	12427-38-2	Endocrine	--
Manganese (non-food)+++	7439-96-5	Nervous	Nervous
MCPA	94-74-6	Urinary, Hepatic	--
MCPB	94-81-5	Hepatic, Reproductive, Urinary	--
Mephosfolan	950-10-7	Hepatic, Urinary, Hematologic, Nervous	--
Mepiquat	24307-26-4	Nervous, Hematologic, Body Weight	--
Mercury (elemental)	7439-97-6	--	Nervous
Mercury (methyl)	22967-92-6	Nervous, Developmental	--
Mercury and compounds	7487-94-7	Immune, Urinary	Nervous
Merphos	150-50-5	Nervous, Body Weight	--
Merphos oxide	78-48-8	Nervous	--
Metalaxyl	57837-19-1	Hepatic	--
Methacrylonitrile	126-98-7	Hepatic	Hepatic
Methamidophos	10265-92-6	Nervous	--
Methanol	67-56-1	Developmental	Nervous, Developmental
Methidathion	950-37-8	Hepatic	--
Methomyl	16752-77-5	Immune, Urinary	--
Methoxychlor	72-43-5	Developmental	--
Methyl acetate	79-20-9	Nervous	--
Methyl acrylate	96-33-3	--	Respiratory
Methyl ethyl ketone	78-93-3	Developmental	Developmental, Musculoskeletal
Methyl isobutyl ketone	108-10-1	--	Developmental, Musculoskeletal

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
Methyl methacrylate	80-62-6	No Adverse Effect	Nervous, Respiratory
Methyl parathion	298-00-0	Nervous	Hematologic
Methyl phosphonic acid	993-13-5	Reproductive	--
Methyl styrene (alpha)	98-83-9	Hepatic, Urinary	--
Methyl styrene (mixture)	25013-15-4	Repiratory	Respiratory
Methyl tertbutyl ether (MTBE)	1634-04-4	--	Organ Weight
Methylene bromide	74-95-3	--	Hematologic
Methylene chloride	75-09-2	Hepatic	Hepatic
Metolaclor (Dual)	51218-45-2	Reproductive, Body Weight	--
Metribuzin	21087-64-9	Hepatic, Urinary, Body Weight, Whole Body	--
Mirex	2385-85-5	Endocrine, Hepatic	--
m-Nitrotoluene	99-08-1	Immune	--
Molinate	2212-67-1	Reproductive	--
Molybdenum	7439-98-7	Urinary	--
Monochloramine	10599-90-3	No Adverse Effect	--
m-Phenylenediamine	108-45-2	Hepatic	--
N,N-Dimethylformamide	68-12-2	Hepatic	Hepatic
N,N-Diphenyl-1,4 benzenediamine (DPPD)	74-31-7	Urinary, Body Weight	--
Naled	300-76-5	Nervous	--
Naphthalene	91-20-3		
Napropamide	15299-99-7	Reproductive	--
n-Hexane	110-54-3	--	Nervous
Nickel and compounds	7440-02-0	Body Weight, Organ Weight	Respiratory
Nickel refinery dust	7440-02-0-NRD	Developmental	Respiratory, Hematologic
Nickel subsulfide	12035-72-2	Developmental	Respiratory, Hematologic
Nitrate	14797-55-8	Hematologic	--
Nitrobenzene	98-95-3	Hematologic	Nervous, Respiratory
Nitrofurantoin	67-20-9	Reproductive	--
Nitroglycerin	55-63-0	Cardiovascular	--
Nitroguanidine	556-88-7	Developmental, Body Weight	--
N-N-Dimethylaniline	121-69-7	Immune, Hematologic	--
N-Nitrosodimethylamine	62-75-9	Hepatic, Developmental	Body Weight
Norflurazon	27314-13-2	Endocrine, Hepatic	--
n-Propylbenzene	103-65-1	Hepatic, Urinary	Developmental
NuStar	85509-19-9	Hepatic	--
o-Chloronitrobenzene	88-73-3	Hematologic, Hepatic, Urinary, Immune	Respiratory
o-Chlorotoluene	95-49-8	Body Weight	--
Octabromodiphenyl ether	32536-52-0	Hepatic	--
Octamethylpyrophosphoramide	152-16-9	Hematologic	--
o-Nitrotoluene	99-08-1	Muscoskeletal, Hepatic	--
Oryzalin	19044-88-3	Endocrine, Hepatic, Urinary	--
Oxadiazon	19666-30-9	Hepatic, Hematologic	--
Oxamyl	23135-22-0	Body Weight	--

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
Oxyfluorfen	42874-03-3	Hepatic	--
Paclobutrazol	76738-62-0	Hepatic	--
Paraquat	4685-14-7	Respiratory	--
Parathion	56-38-2	Nervous	--
p-Chlorobenzoic acid	74-11-3	Reproductive	--
p-Chloronitrobenzene	100-00-5	Hematologic	Hematologic
Pebulate	1114-71-2	Hematologic	--
Pendimethalin	40487-42-1	Hepatic	--
Pentabromo-6-chloro cyclohexane	87-84-3	Hepatic, Gastrointestinal	--
Pentabromodiphenyl ether	32534-81-9	Hepatic	--
Pentachlorobenzene	608-93-5	Hepatic, Urinary	--
Pentachloronitrobenzene	82-68-8	Hepatic	--
Pentachlorophenol	87-86-5	Hepatic	--
Perchlorate	14797-73-0	Endocrine	--
Perfluorobutane sulfonic acid (PFBS)	375-73-5	Urinary	--
Perfluorobutanesulfonate	45187-15-3	Urinary	--
Perfluoro-octanesulfonate (PFOS)	1763-23-1	Developmental	--
Perfluorooctanoic acid (PFOA)	335-67-1	Hepatic, Muscoskeletal, Developmental, Body Weight, Urinary	--
Permethrin	52645-53-1	Hepatic	--
Phenmedipham	13684-63-4	No Adverse Effect	--
Phenol	108-95-2	Body Weight	Respiratory, Ocular
Phenylmercuric acetate	62-38-4	Urinary	--
Phorate	298-02-2	Nervous	--
Phosmet	732-11-6	Nervous, Hepatic, Body Weight	--
Phosphine	7803-51-2	Body Weight	Body Weight
Phosphoric acid	7664-38-2	Urinary	Respiratory
Phosphorus (white)	7723-14-0	Reproductive, Dermal	--
Phthalic anhydride	85-44-9	Urinary, Respiratory	Respiratory
p-Hydroquinone	123-31-9	Hematologic, Urinary	--
Picloram	1918-02-1	Hepatic	--
Pirimiphos-methyl	29232-93-7	Nervous	--
p-Nitrotoluene	99-99-0	Urinary	--
Polybrominated biphenyls (PBBs)	67774-32-7	Hepatic	--
p-Phenylenediamine	106-50-3	Urinary, Hepatic	--
p-Phthalic acid	100-21-0	Urinary	--
Prochloraz	67747-09-5	Hepatic	--
Profluralin	26399-36-0	No Adverse Effect	--
Prometon	1610-18-0	No Adverse Effect	--
Prometryn	7287-19-6	Hematologic, Hepatic, Immune, Urinary	--
Pronamide	23950-58-5	No Adverse Effect	--
Propachlor	1918-16-7	Hepatic, Body Weight	--
Propanil	709-98-8	Immune	--

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
Propargite	2312-35-8	Developmental, Muscoskeletal	--
Propargyl alcohol	107-19-7	Hepatic, Urinary	--
Propazine	139-40-2	Body Weight	--
Propham	122-42-9	Nervous, Immune	--
Propiconazole	60207-90-1	Gastrointestinal	--
Propylene glycol	57-55-6	Hematologic	--
Propylene glycol, monoethyl ether	52125-53-8	Hepatic, Urinary	Hepatic, Respiratory, Ocular
Propylene glycol, monomethyl ether	107-98-2	Hepatic, Urinary	Hepatic, Respiratory, Ocular
Propylene oxide	75-56-9	--	Respiratory
p-Toluidine	106-49-0	Hematologic	--
Pursuit	81335-77-5	Hematologic	--
Pydrin	51630-58-1	Nervous	--
Pyrene	129-00-0	Urinary	--
Pyridine	110-86-1	Hepatic	--
Quinalphos	13593-03-8	No Adverse Effect	--
RDX (Cyclonite)	121-82-4	Reproductive	--
Resmethrin	10453-86-8	Reproductive	--
Ronnel	299-84-3	Hepatic	--
Rotenone	83-79-4	Developmental	--
Savey	78587-05-0	Endocrine, Hematologic	--
Selenious Acid	7783-00-8	Nervous, Hematologic, Dermal	--
Selenium	7782-49-2	Nervous, Hematologic, Dermal,	Hepatic, Cardiovascular, Nervous
Sethoxydim	74051-80-2	Hematologic	--
Silver and compounds	7440-22-4	Dermal	--
Simazine	122-34-9	Hematologic, Body Weight	--
Sodium azide	26628-22-8	Body Weight	--
Sodium diethyldithiocarbamate	148-18-5	Body Weight	--
Sodium fluoroacetate	62-74-8	Reproductive, Cardiovascular	--
Sodium metavanadate	13718-26-8	Urinary	--
Strontium, stable	7440-24-6	Muscoskeletal	--
Strychnine	57-24-9	Whole Body	--
Styrene	100-42-5	Hepatic, Hematologic	Nervous
Systhane	88671-89-0	Reproductive	--
Tebuthiuron	34014-18-1	Body Weight	--
Temephos	3383-96-8	Nervous	--
Terbacil	5902-51-2	Endocrine, Hepatic	--
Terbufos	13071-79-9	Nervous	--
Terbutryn	886-50-0	Hematologic	--
Tetrachloroethylene (PCE)	127-18-4	Nervous, Ocular	Nervous, Ocular
Tetrachlorovinphos	961-11-5	Nervous, Hepatic, Urinary, Body Weight	--
Tetraethyldithiopyrophosphate	3689-24-5	Nervous	--
Thallium and compounds	7440-28-0	Dermal	--
Thiobencarb	28249-77-6	Urinary, Body Weight	--

ATTACHMENT E - TARGET ORGANS FOR NONCARCINOGENIC EFFECTS

Chemical	CASNo	ORAL/DERMAL	INHALATION
		All Organs	All Organs
Thiofanox	39196-18-4	Nervous	--
Thiophanate-methyl	23564-05-8	Endocrine, Reproductive	--
Thiram	137-26-8	Nervous	--
Tin and compounds	7440-31-5	Hepatic, Urinary	--
Toluene	108-88-3	Urinary	Nervous
Tralomethrin	66841-25-6	Body Weight	--
Triallate	2303-17-5	Hepatic	--
Triasulfuron	82097-50-5	Hepatic	--
Tributyltin oxide (TBTO)	56-35-9	Immune	--
Trichloroethylene (TCE)+++	79-01-6	Immune, Cardiovascular, Developmental,	Immune, Cardiovascular, Developmental
Trichlorofluoromethane	75-69-4	Respiratory, Cardiovascular, Whole Body	--
Tridiphane	58138-08-2	Reproductive, Body Weight	--
Triethylamine	121-44-8	--	Respiratory
Trifluralin	1582-09-8	Hepatic, Hematologic	--
Trimethyl phosphate	512-56-1	Body Weight, Reproductive	--
Trinitrophenylmethylnitramine	479-45-8	Hematologic, Urinary, Immune, Hepatic	--
Triphenylphosphine oxide	791-28-6	Nervous	--
Tris(2-chloroethyl) phosphate	115-96-8	Hepatic, Urinary	--
Uranium (chemical toxicity only)	7440-61-0	Urinary	Urinary
Vanadium and compounds+++	7440-62-2	Dermal	Respiratory
Vernam	1929-77-7	Body Weight	--
Vinclozolin	50471-44-8	Endocrine, Urinary	--
Vinyl acetate	108-05-4	Body Weight, Urinary	Nervous, Respiratory
Vinyl bromide	593-60-2	--	Hepatic
Vinyl chloride+++	75-01-4	Hepatic	Hepatic
Warfarin	81-81-2	Hematologic	--
Xylenes	1330-20-7	Body Weight, Whole Body	Nervous
Zinc	7440-66-6	Immune, Hematologic	--
Zinc phosphide	1314-84-7	Body Weight	--
Zineb	12122-67-7	Endocrine	--

ATTACHMENT F

EPA REGION 7 ACTION LEVELS FOR TRICHLOROETHYLENE IN AIR

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

NOV 0 2 2016

MEMORANDUM

SUBJECT: EPA Region 7 Action Levels for Trichloroethylene in Air

FROM: Mike Beringer, Chief
Environmental Data & Assessment Branch
Environmental Sciences & Technology Division

TO: Branch Chiefs
Waste Enforcement and Materials Management Branch
and Waste Remediation & Permitting Branch
Air and Waste Management Division

Branch Chiefs
Superfund Division

The purpose of this memorandum is to update the U.S. Environmental Protection Agency Region 7 RCRA and Superfund programs on the recommended action levels for trichloroethylene (TCE) in air, and provide information on characterizing and addressing human health risks from less-than-lifetime exposures. The action level for a residential scenario is 2 $\mu g/m^3$, and the action level for an industrial/commercial scenario with an 8-hr workday is 6 $\mu g/m^3$. Equations to allow derivation of action levels for alternative scenarios, such as a 10-hr workday, are presented. As described in this attachment, it is assumed that an exposure to TCE at any time during an approximate three-week period in early pregnancy could result in one or more types of cardiac malformations. Thus, the critical exposure period of concern used to evaluate the potential for heart defects and derive action levels for TCE is one day. An exceedance of the TCE action level indicates a potential imminent threat to human health. Region 7 should expedite early or interim action(s) to eliminate, reduce, and/or control the hazards posed by the site as quickly as possible. If you or your staff have any questions or need further assistance, please contact Kelly Schumacher (x7963).

EPA Region 7 Action Levels for Trichloroethylene in Air.	
Exposure Scenario	*Action Level*
Residential (24 hours/day)	**2 $\mu g/m^3$**
Industrial/Commercial (8 hours/day)[1]	**6 $\mu g/m^3$**

[1] Site-specific action levels should be derived when the workday differs from 8 hours/day.

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Attachment

EPA Region 7 Action Levels for Trichloroethylene in Air

Introduction

In 2011, the latest human health toxicity values for trichloroethylene were published by the United States Environmental Protection Agency's Integrated Risk Information System program (EPA, 2011a). As discussed in this document, these new values are partly based on developmental health effects that result from less-than-lifetime exposures. In contrast, the toxicity values typically used to evaluate potential health risks and derive action levels at Superfund and RCRA sites are based on health effects associated with long-term, or chronic exposures. Further, the equations and exposure parameters used typically reflect all or a significant portion of a person's lifetime. Once the current TCE values were released, the protectiveness of using traditional approaches to assess and address TCE exposures was questioned. The purpose of this memorandum is to update the EPA Region 7 RCRA and Superfund programs on the recommended action levels for TCE in air and provide information on characterizing and addressing human health risks from less-than-lifetime exposures. To support these objectives, the window of susceptibility for the developmental toxicity associated with TCE is examined, the critical exposure period of concern is identified, and the appropriate exposure parameters and equations are elucidated.

Toxicity Assessment

The EPA's final toxicological review by the IRIS program incorporates comments by the U.S. National Academy of Sciences (National Research Council, 2006), two U.S. EPA Science Advisory Boards (EPA, 2002 and 2011b), the Executive Office of the President (Office of Management and Budget, 2009 and 2011), the U.S. Department of Defense (DOD, 2009a, 2009b and 2011), the National Aeronautics and Space Administration (NASA, 2009 and 2011), internal Agency reviewers, and the public, among others. The Halogenated Solvents Industry Alliance, Inc., which represents the interests of TCE manufacturers and producers, submitted a Request for Correction of the TCE IRIS assessment (HSIA, 2013), which was denied by the EPA's Acting Assistant Administrator (EPA, 2015). The HSIA then submitted a Request for Reconsideration (HSIA, 2015), which was also denied by the EPA (EPA, 2016a). The EPA found the Requests "directly contrary to the SAB's conclusions and recommendations, such that to accept HSIA's RFC/RFR would require EPA to reject SAB's advice" (EPA, 2016a).

The EPA's Office of Land and Emergency Management recognizes an IRIS assessment as the official Agency scientific position regarding the toxicity of a chemical based on the data available at the time of the review (EPA, 2003). As such, IRIS is generally the preferred source of human health toxicity values used to evaluate risks at Superfund and RCRA hazardous waste sites. In accordance with Directive 9285.7-53 (EPA, 2003), the 2011 IRIS TCE toxicity values will be used to evaluate risks and derive action levels by the Region 7 RCRA and Superfund programs until the 2011 values are either revised or rescinded.

Non-Carcinogenic Health Effects

In general, the EPA assumes that a dose or exposure level exists below which adverse non-carcinogenic health effects will not occur (EPA, 1989). Below this threshold, it is believed that exposure to a chemical is tolerated without adverse effects. Adverse health effects occur only when physiologic protective mechanisms are overcome by exposure to doses or concentrations above the threshold. For chronic toxicity values, the first adverse effect (or its known precursor) that occurs to the most sensitive species as the dose rate of an agent increases, regardless of the exposure duration, is designated the

critical endpoint. The dose or exposure at which the critical endpoint is observed is the point of departure. Uncertainty factors, ranging from 1 to 3,000, reflecting limitations of the data used are applied to the point of departure to derive the inhalation reference concentration. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime (EPA, 1989).

The 2011 Scientific Advisory Board panel recommended that, "The two endpoints for immune effects from Keil *et al.* (2009) and the cardiac malformations from Johnson *et al.* (2003) should be considered the principal studies supporting the RfC" (EPA, 2011b). The panel considered the immune effects and cardiac malformations co-critical endpoints (EPA, 2011b). In accordance with the SAB panel recommendations, the IRIS program based the TCE chronic reference concentration of 2 $\mu g/m^3$ on these two co-critical endpoints, each of which can support the RfC independently: autoimmune disease following chronic exposure in adults (0.00033 ppm, or 1.8 $\mu g/m^3$) and heart defects following exposure during early pregnancy (0.00037 ppm, or 2.0 $\mu g/m^3$). The RfC is also supported by nephrotoxicity (kidney effects) following chronic exposure in adults (0.00056 ppm, or 3.0 $\mu g/m^3$). Following publication of these values, the developmental cardiac effects were further addressed by the IRIS program in "TCE Developmental Cardiac Toxicity Assessment Update" (EPA, 2014a) and by scientists in the EPA's Office of Research and Development in the peer-reviewed literature (Makris *et al.*, 2016).

Chronic exposure to TCE poses a potential human health hazard to the central nervous system, kidneys, liver, immune system, and male reproductive system. As mentioned above, immunotoxicity in adults is considered a co-critical endpoint, at a slightly lower concentration than that associated with cardiac defects. Overall, the IRIS program concluded that "the human and animal studies of TCE and immune-related effects provide strong evidence for a role of TCE in autoimmune disease and in a specific type of generalized hypersensitivity syndrome" (EPA, 2011a). Kidney toxicity was considered a supporting endpoint, with high confidence found in multiple lines of evidence in both human and animal studies.

Short-term exposures to TCE during pregnancy are associated with many forms of developmental toxicity, including spontaneous abortions, decreased growth, developmental neurotoxicity, developmental immunotoxicity, and birth defects. However, the critical developmental endpoint is cardiac malformations. The primary types of heart defects observed with TCE exposures include atrial and ventricular septal defects, which are holes in the wall (septa) between the top two chambers (atria) or bottom two chambers (ventricles) of the heart, and pulmonary and aortic valve stenoses, which are thickened or fused heart valves that do not properly open and/or close and may leak blood. The critical window of susceptibility for these types of defects is an approximate three week period (i.e., valvuloseptal morphogenesis, or the period in which major cardiac morphogenic events such as heart valve formation occur) approximately four to seven weeks after conception, early in the first trimester of human pregnancy (Dhanantwari *et al.*, 2009). The type and severity of the resulting cardiac malformation or malformations depends on the timing and level of exposure to TCE within this approximate three week period. Exposures that clear the body before this period do not impact the heart valves and septa, because they have not yet begun to form. In humans, TCE and most of its metabolites are eliminated within a week of exposure (EPA, 2011a).

Carcinogenic Effects

The EPA evaluates carcinogenicity in two parts (EPA, 2005a). First, the Agency evaluates all available scientific information and assigns a weight-of-evidence classification based on a compound's potential to cause cancer in humans. In the absence of sufficient data regarding the mode of action or if the

weight-of-evidence supports a mutagenic mode of action, the EPA generally assumes that any exposure to a chemical will increase an individual's risk of developing cancer. Under this default approach, there is no threshold below which the probability of developing cancer is zero. Second, a toxicity value is derived to define the quantitative relationship between dose or concentration and carcinogenic response. For inhalation exposures using the default approach, this value is known as the inhalation unit risk. The IUR is a generally plausible upper-bound estimate of the increased probability of developing cancer following a lifetime of exposure. This value is used to estimate the increased risk of developing cancer from inhalation of potentially carcinogenic chemicals.

Following the EPA's Guidelines for Carcinogen Risk Assessment (EPA, 2005a), the IRIS program has evaluated the carcinogenic potential of TCE and has classified it as "carcinogenic to humans" by all routes of exposure. This conclusion is based on convincing evidence of a causal association between TCE exposure in humans and kidney cancer, strong evidence of non-Hodgkin's lymphoma, and more limited evidence of liver and biliary tract cancer. The inhalation unit risk for TCE, based on these combined cancer types, is 4.1E-06 $(\mu g/m^3)^{-1}$. Sufficient evidence supports a mutagenic mode of action for TCE-induced kidney tumors in humans, but modes of actions have not been established for the other TCE-induced cancer types. The portion of the TCE IUR specific for kidney tumors is 1.0E-06 $(\mu g/m^3)^{-1}$, while the IUR for non-Hodgkin's lymphoma plus liver and biliary tract cancers is 3.1E-06 $(\mu g/m^3)^{-1}$.

Risk Characterization

The EPA's RCRA and Superfund programs characterize potential human health risks using standardized equations that combine toxicity values with exposure parameters because risk is a function of both hazard and exposure. Typically, the EPA's standard default exposure parameters for chronic scenarios, published in OSWER Directive 9200.1-120 (EPA, 2014b), are used. However, exposure assessments must take into account the time scale related to the specific biological response (NRC, 1991). This means that exposure parameters selected to evaluate risks and/or develop levels of concern for a given chemical and scenario should correspond as closely as possible with the exposure period used to develop the toxicity value. For example, time-weighted average exposures over a lifetime have little relevance for a developmental toxin if the adverse effects could only occur following exposure during a particular stage of development (EPA, 1992).

Non-Cancer Hazard Quotients for Cardiac Defects

The toxicity values considered protective for a lifetime of exposure to TCE are partly based on non-cancer health effects resulting from less-than-lifetime exposures. As previously stated, one of the two co-critical endpoints that serves as the basis for the TCE RfC is cardiac defects. This effect can only occur when the fetus is exposed during the period of heart development. Therefore, the EPA's standard default exposure parameters for chronic exposures are invalid for estimating hazard quotients representing the potential for cardiac defects associated with TCE exposures and for deriving TCE levels of concern that are protective of developmental endpoints. To select appropriate less-than-lifetime exposure parameters that may be used to characterize these hazards and derive levels of concern, the critical exposure period of concern for TCE-related heart malformations must first be identified.

"[F]or developmental toxic effects, a primary assumption is that a single exposure at a critical time in development may produce an adverse developmental effect, i.e., repeated exposure is not a necessary prerequisite for developmental toxicity to be manifested" (EPA, 1991). The EPA's Risk Assessment Guidance for Superfund Part A (EPA, 1989) directs the use of a day or a single exposure incident to assess the potential risks of adverse developmental effects. Following this guidance, it is assumed that a

single exposure to TCE at any time during the approximate three week period of valvuloseptal morphogenesis could result in one or more of the types of heart malformations described previously. Thus, the critical exposure period of concern used to evaluate the potential for cardiac defects is one day. A 24-hour exposure period has been used by the EPA to evaluate acute hazards associated with TCE in the final, peer-reviewed TSCA Work Plan Chemical Risk Assessment (EPA, 2014c).

The EPA's Risk Assessment Guidance for Superfund Part F, Supplemental Guidance for Inhalation Risk Assessment (EPA, 2009) specifies that the exposure concentration (EC) that should be used to evaluate risks and derive levels of concern for acute endpoints is equivalent to the concentration detected in air (CA), as shown in Equation 1.

$$EC\left(\frac{\mu g}{m^3}\right) = CA\left(\frac{\mu g}{m^3}\right) \quad (1)$$

For a residential scenario, in which exposure to TCE inside a home is assumed to occur throughout the entire exposure period of concern, Equation 1 is appropriate. However, for other types of scenarios (e.g., industrial, commercial, recreational), exposures to TCE only occur for a portion of any given 24-hour period. Moreover, exposures to different concentrations of TCE may occur within a single day at some sites. To account for these multiple exposures, Equation 1 can be modified, resulting in a time-weighted average exposure concentration. The 24-hour TWA exposure concentration can be calculated using Equation 2.

$$EC_{24} = \sum_{i=1}^{n}(CA_i \cdot ET_i)/AT_{24} \quad (2)$$

where: EC_{24} ($\mu g/m^3$) = time-weighted average exposure concentration over 24 hours;
CA_i ($\mu g/m^3$) = TCE concentration in air in microenvironment (ME) i;
ET_i (hours) = exposure time spent in ME i;
AT_{24} (hours) = averaging time for the exposure period of concern (24 hours)

In a residential scenario, there is a single microenvironment, the residence, with an exposure time of 24 hours. Thus, the Residential EC_{24} will equal CA_{res}, as shown in Equation 3. To reduce uncertainty in residential scenarios, CA_{res} should be based on air samples collected for an entire 24-hour exposure period. Generally, stationary 24-hour indoor air sample results are used.

$$Residential\ EC_{24} = \frac{(CA_{res} \cdot 24\ hrs)}{24\ hrs} = CA_{res} \quad (3)$$

In a typical industrial or commercial scenario, there are two microenvironments. One is the workplace, and the other is away from the workplace. The Industrial/Commercial EC_{24} can be calculated using Equation 4, below. Although the standard value for ET_{work} is an 8-hour workday, this variable should reflect site-specific conditions. For example, employees at a given site may work longer shifts, such as 10 or 12 hours, and they may or may not take their lunch breaks on site. CA_{work} should be based on air samples collected for the entire exposure time, ET_{work}, during the portion of the day that workers are present. This is to prevent potential underestimates of TCE concentrations if diurnal variations occur at a site, although such variability does not exist at all sites. Generally, stationary 8-hour or 10-hour indoor air samples are appropriate. ET_{away} should equal the remainder of the 24-hour period spent away from the workplace. CA_{away} is generally assumed to equal zero, unless site-specific data suggest otherwise.

$$Industrial/Commercial\ EC_{24} = \frac{(CA_{work} \cdot ET_{work}) + (CA_{away} \cdot ET_{away})}{24\ hrs} \quad (4)$$

If multiple or variable microenvironments are present at a site, it is possible to use Equation 2 to generate a 24-hour TWA exposure concentration. However, consideration should be given to the use of portable sampling equipment to more accurately measure true exposure concentrations to the receptor(s) of concern over the entire exposure time, as opposed to stationary sampling equipment positioned in multiple areas where exposure occurs.

Non-cancer hazard quotients for heart defects can be derived using Equation 5, where HQ_{24} is the developmental hazard quotient; EC_{24} is the 24-hr time-weighted average exposure concentration calculated using Equations 2, 3, or 4; and the RfC is 2 $\mu g/m^3$. As shown in Equation 5, a hazard quotient is the ratio of the exposure to the non-cancer toxicity value. Thus, an HQ greater than 1 means that the exposure is greater than the RfC and exceeds a level of concern for that particular non-cancer health effect.

$$HQ_{24} = \frac{EC_{24}}{RfC} \tag{5}$$

Equation 5 can be combined with Equation 3 or 4 to calculate the developmental hazard quotients (HQ_{24}) for a residential or industrial/commercial receptor, as follows.

$$Residential\ HQ_{24} = \frac{CA_{res}}{2\,\frac{\mu g}{m^3}} \tag{6}$$

$$Industrial/Commercial\ HQ_{24} = \frac{(CA_{work}\cdot ET_{work})+(CA_{away}\cdot ET_{away})}{24\ hrs\cdot 2\,\frac{\mu g}{m^3}} \tag{7}$$

Non-Cancer Hazard Quotients for Chronic Health Effects

Autoimmune disease, a co-critical endpoint upon which the TCE RfC is based, and kidney toxicity, the supporting endpoint, are both health effects associated with chronic or long-term exposures. Equation 8 is the standardized equation used to evaluate non-cancer hazard quotients for chronic health effects; the exposure parameters are defined in Table 1. If seasonal or temporal fluctuations in TCE concentrations potentially exist, consideration should be given as to whether sufficient data are available to generate an average concentration for use as the CA term. If the dataset is limited, it may be more health-protective to use the highest concentration detected.

$$HQ_{chronic} = \frac{CA\left(\frac{\mu g}{m^3}\right)\cdot ET\left(\frac{hrs}{day}\right)\cdot\left(\frac{1\ day}{24\ hrs}\right)\cdot EF\left(\frac{days}{year}\right)\cdot ED(years)}{AT_{nc,chronic}(days)\cdot RfC\left(\frac{\mu g}{m^3}\right)} \tag{8}$$

The above equation can be presented in terms of residential or industrial/commercial exposure scenarios, as shown below. Note that it is only appropriate to calculate non-cancer hazard quotients for chronic health effects for those receptors with long-term exposures.

$$Residential\ HQ_{chronic} = \frac{CA_{res}\left(\frac{\mu g}{m^3}\right)\cdot ET_{res}\left(\frac{hrs}{day}\right)\cdot\left(\frac{1\ day}{24\ hrs}\right)\cdot EF_{res}\left(\frac{days}{year}\right)\cdot ED_{child}(years)}{AT_{nc,chronic,child}(days)\cdot RfC\left(\frac{\mu g}{m^3}\right)} \tag{9}$$

$$Industrial/Commercial\ HQ_{chronic} = \frac{CA_{work}\left(\frac{\mu g}{m^3}\right)\cdot ET_{work}\left(\frac{hrs}{day}\right)\cdot\left(\frac{1\ day}{24\ hrs}\right)\cdot EF_{work}\left(\frac{days}{year}\right)\cdot ED_{work}(years)}{AT_{nc,chronic,work}(days)\cdot RfC\left(\frac{\mu g}{m^3}\right)} \tag{10}$$

Cancer Risks

TCE is classified "carcinogenic to humans," based on kidney cancer, non-Hodgkin's lymphoma, and liver and biliary tract cancer. Equation 11 is the standardized equation used to evaluate excess individual lifetime cancer risks; the exposure parameters are defined in Table 1. If temporal fluctuations in TCE concentrations potentially exist, consideration should be given as to whether sufficient data are available to generate an average concentration for use as the CA term. If the dataset is limited, it may be more health-protective to use the highest concentration detected.

$$CR = \frac{CA\left(\frac{\mu g}{m^3}\right) \cdot ET\left(\frac{hrs}{day}\right) \cdot \left(\frac{1\ day}{24\ hrs}\right) \cdot EF\left(\frac{days}{year}\right) \cdot ED(years) \cdot IUR\left(\frac{\mu g}{m^3}\right)^{-1}}{AT_{cancer}(days)} \quad (11)$$

The above equation can be presented in terms of residential or industrial/commercial exposure scenarios, as shown below. Because a mutagenic mode of action has been established for kidney tumors associated with TCE, it is necessary to apply age-dependent adjustment factors when deriving risks for this cancer type in children (EPA, 2005b). ADAFs are not applied when deriving risks for non-Hodgkin's lymphoma or liver and biliary tract cancers associated with TCE exposures because they have not been determined to operate via a mutagenic mode of action. Because only adults are evaluated in an industrial/commercial exposure scenario and no adjustments for mutagenicity are made for adults (i.e., $ADAF_{adult} = 1$), ADAFs are not included in Equation 13.

$$Residential\ CR = \left(\frac{CA_{res}\left(\frac{\mu g}{m^3}\right) \cdot ET_{res}\left(\frac{hrs}{day}\right) \cdot \left(\frac{1\ day}{24\ hrs}\right) \cdot EF_{res}\left(\frac{days}{year}\right)}{AT_{cancer}(days)}\right) \cdot \left[\left(ED_{0-2}(years) \cdot IUR_{kid}\left(\frac{\mu g}{m^3}\right)^{-1} \cdot ADAF_{0-2}\right) + \left(ED_{2-16}(years) \cdot IUR_{kid}\left(\frac{\mu g}{m^3}\right)^{-1} \cdot ADAF_{2-16}\right) + \left(ED_{16-26}(years) \cdot IUR_{kid}\left(\frac{\mu g}{m^3}\right)^{-1} \cdot ADAF_{adult}\right) + \left(ED_{res}(years) \cdot IUR_{N\&L}\left(\frac{\mu g}{m^3}\right)^{-1}\right)\right] \quad (12)$$

$$Industrial/Commercial\ CR = \frac{CA_{work}\left(\frac{\mu g}{m^3}\right) \cdot ET_{work}\left(\frac{hrs}{day}\right) \cdot \left(\frac{1\ day}{24\ hrs}\right) \cdot EF_{work}\left(\frac{days}{year}\right) \cdot ED_{work}(years) \cdot IUR\left(\frac{\mu g}{m^3}\right)^{-1}}{AT_{cancer}(days)} \quad (13)$$

The definitions, values, and references for the exposure parameters and toxicity values used in this document are provided in Table 1. For the chronic scenarios, the EPA's standard default exposure parameters (EPA, 2014b) are used to best represent reasonable maximum exposure scenarios, which are the highest exposures reasonably expected to occur at a site (EPA, 1989). These values are based on the 2011 Exposure Factors Handbook (EPA, 2011c). Although the default exposure time for an indoor worker is 8 hours/day, it is preferable to identify a site-specific worker exposure time.

Table 1. Exposure Parameters and Toxicity Values.

Parameter	Definition	Units	Value	Reference
$ADAF_{0-2}$	Age-dependent adjustment factor – ages 0 to 2 years	-	10	EPA, 2005b
$ADAF_{2-16}$	Age-dependent adjustment factor – ages 2 to 16 years	-	3	EPA, 2005b
$ADAF_{adult}$	Age-dependent adjustment factor – ages 16 years and older	-	1	EPA, 2005b
AT_{24}	Averaging time – developmental effects	hours	24	-
AT_{cancer}	Averaging time – cancer	days	25,550	EPA, 2014b

Table 1. Exposure Parameters and Toxicity Values.				
Parameter	**Definition**	**Units**	**Value**	**Reference**
$AT_{nc,chronic,\ child}$	Averaging time – chronic non-cancer health effects, resident child	days	2,190	EPA, 2014b
$AT_{nc,chronic,\ work}$	Averaging time – chronic non-cancer health effects, indoor worker	days	9,125	EPA, 2014b
CA	Concentration of TCE in air	$\mu g/m^3$	Measured	-
CA_{res}	Concentration of TCE in air of the residence	$\mu g/m^3$	Measured	-
CA_{work}	Concentration of TCE in air of the workplace	$\mu g/m^3$	Measured	-
$ED_{0\text{-}2}$	Exposure duration – ages 0 to 2 years	years	2	EPA, 2005b
$ED_{2\text{-}16}$	Exposure duration – ages 2 to 16 years	years	14	EPA, 2005b
$ED_{16\text{-}26}$	Exposure duration – ages 16 to 26 years	years	10	EPA, 2005b
ED_{child}	Exposure duration – resident (child, ages 0 to 6 years)	years	6	EPA, 2014b
ED_{res}	Exposure duration – resident (child + adult, ages 0 to 26 years)	years	26	EPA, 2014b
ED_{work}	Exposure duration – indoor worker	years	25	EPA, 2014b
EF_{res}	Exposure frequency – resident	days/yr	350	EPA, 2014b
EF_{work}	Exposure frequency – indoor worker	days/yr	250	EPA, 2014b
ET_{away}	Exposure time – time spent away from work by an indoor worker (24 hrs/day minus ET_{work})	hrs/day	16 or site-specific	-
ET_{res}	Exposure time – time spent at home by a resident	hrs/day	24	EPA, 2014b
ET_{work}	Exposure time – time spent at work by an indoor worker	hrs/day	8 or site-specific	EPA, 2014b or site-specific
IUR	TCE inhalation unit risk - total	$(\mu g/m^3)^{-1}$	4.1E-06	EPA, 2011a
IUR_{kid}	TCE inhalation unit risk – kidney cancer	$(\mu g/m^3)^{-1}$	1.0E-06	EPA, 2011a
$IUR_{N\&L}$	TCE inhalation unit risk – non-Hodgkin's lymphoma and liver and biliary tract cancers	$(\mu g/m^3)^{-1}$	3.1E-06	EPA, 2011a
RfC	TCE reference concentration	$\mu g/m^3$	2	EPA, 2011a
THQ	Target hazard quotient	-	1	-
TR	Target cancer risk	-	1E-04	Upper-end of Target Cancer Risk Range

Action Levels

Level of Concern for Developmental Effects

Equations 2 and 5 can be manipulated to solve for the level of concern for developmental health effects, using a target non-cancer hazard quotient of 1, as follows. Note that the only exposure parameter that can vary in this calculation is the exposure time. The TCE levels of concern for developmental effects based on standard exposure times are provided in Table 2. For a 24-hour residential scenario, the developmental LOC equals 2 $\mu g/m^3$. For a typical 8-hour industrial/commercial scenario, the developmental LOC equals 6 $\mu g/m^3$. Site-specific developmental LOCs may be derived using alternate exposure times; for example, a 10-hour exposure time results in a developmental LOC of 4.8 $\mu g/m^3$.

$$TCE\ LOC_{developmental}\left(\frac{\mu g}{m^3}\right) = \frac{THQ \cdot AT_{24}(hrs) \cdot RfC\left(\frac{\mu g}{m^3}\right)}{ET\left(\frac{hrs}{day}\right)} \quad (14)$$

$$TCE\ Residential\ LOC_{developmental}\left(\frac{\mu g}{m^3}\right) = \frac{1 \cdot 24\ hrs \cdot 2\ \frac{\mu g}{m^3}}{24\ hrs} \quad (15)$$

$$TCE\ Industrial/Commercial\ LOC_{developmental}\left(\frac{\mu g}{m^3}\right) = \frac{1 \cdot 24\ hrs \cdot 2\ \frac{\mu g}{m^3}}{ET_{work}\left(\frac{hrs}{day}\right)} \quad (16)$$

Level of Concern for Chronic Non-Cancer Health Effects

Equation 8 can be manipulated to solve for the level of concern for chronic, non-cancer health effects, using a target non-cancer hazard quotient of 1 and the exposure parameters presented in Table 1, as follows. For a residential scenario, this LOC equals 2.1 µg/m^3, which is the value listed as the non-cancer residential air Regional Screening Level for TCE, based on an HQ of 1 (EPA, 2016b). For an industrial/commercial scenario, the chronic LOC equals 8.8 µg/m^3, which is the value listed as the non-cancer worker air RSL for TCE, based on an HQ of 1. Site-specific chronic LOCs may be derived using alternate exposure times or other parameters.

$$TCE\ LOC_{chronic}\left(\frac{\mu g}{m^3}\right) = \frac{THQ \cdot AT_{nc,chronic}(days) \cdot RfC\left(\frac{\mu g}{m^3}\right)}{ET\left(\frac{hrs}{day}\right) \cdot \left(\frac{1\ day}{24\ hrs}\right) \cdot EF\left(\frac{days}{year}\right) \cdot ED(years)} \quad (17)$$

$$TCE\ Residential\ LOC_{chronic}\left(\frac{\mu g}{m^3}\right) = \frac{THQ \cdot AT_{nc,chronic,child}(days) \cdot RfC\left(\frac{\mu g}{m^3}\right)}{ET_{res}\left(\frac{hrs}{day}\right) \cdot \left(\frac{1\ day}{24\ hrs}\right) \cdot EF_{res}\left(\frac{days}{year}\right) \cdot ED_{child}(years)} \quad (18)$$

$$TCE\ Industrial/Commercial\ LOC_{chronic}\left(\frac{\mu g}{m^3}\right) = \frac{THQ \cdot AT_{nc,chronic,work}(days) \cdot RfC\left(\frac{\mu g}{m^3}\right)}{ET_{work}\left(\frac{hrs}{day}\right) \cdot \left(\frac{1\ day}{24\ hrs}\right) \cdot EF_{work}\left(\frac{days}{year}\right) \cdot ED_{work}(years)} \quad (19)$$

Level of Concern for Cancer Risks

Equations 11, 12, and 13 can be manipulated to solve for the level of concern for cancer risks, using a target excess cancer risk (TR) of 1E-04, which is the upper bound of the EPA's target cancer risk range, and the exposure parameters presented in Table 1, as follows. For a residential scenario, this LOC equals 48 µg/m^3, and for an industrial/commercial scenario, the cancer LOC equals 300 µg/m^3.

$$TCE\ LOC_{cancer}\left(\frac{\mu g}{m^3}\right) = \frac{TR \cdot AT_{cancer}(days)}{ET\left(\frac{hrs}{day}\right) \cdot \left(\frac{1\ day}{24\ hrs}\right) \cdot EF\left(\frac{days}{year}\right) \cdot ED(years) \cdot IUR\left(\frac{\mu g}{m^3}\right)^{-1}} \quad (20)$$

$$TCE\ Residential\ LOC_{cancer}\left(\frac{\mu g}{m^3}\right) = \frac{TR \cdot AT_{cancer}(days)}{ET\left(\frac{hrs}{day}\right) \cdot \left(\frac{1\ day}{24\ hrs}\right) \cdot EF\left(\frac{days}{year}\right) \cdot \left[\begin{array}{c}\left(ED_{0-2}(years) \cdot IUR_{kid}\left(\frac{\mu g}{m^3}\right)^{-1} \cdot ADAF_{0-2}\right) + \left(ED_{2-16}(years) \cdot IUR_{kid}\left(\frac{\mu g}{m^3}\right)^{-1} \cdot ADAF_{2-16}\right) + \\ \left(ED_{16-26}(years) \cdot IUR_{kid}\left(\frac{\mu g}{m^3}\right)^{-1} \cdot ADAF_{16-26}\right) + \left(ED_{res}(years) \cdot IUR_{N\&L}\left(\frac{\mu g}{m^3}\right)^{-1}\right)\end{array}\right]} \quad (21)$$

$$TCE\ Industrial/Comm.\ LOC_{cancer}\left(\frac{\mu g}{m^3}\right) = \frac{TR \cdot AT_{cancer}(days)}{ET_{work}\left(\frac{hrs}{day}\right) \cdot \left(\frac{1\ day}{24\ hrs}\right) \cdot EF_{work}\left(\frac{days}{year}\right) \cdot ED_{work}(years) \cdot IUR\left(\frac{\mu g}{m^3}\right)^{-1}} \quad (22)$$

As shown below in Table 2, the levels of concern for developmental health effects are lower than the LOCs for chronic health effects and cancer, for both residential and occupational scenarios, when based on target hazard quotients of 1 or target cancer risks of 1E-04. These are the levels of risk that, when exceeded, warrant action under the National Contingency Plan. Basing the Region 7 TCE action levels

on the developmental LOCs is protective for all potential forms of adverse health effects associated with TCE. Thus, the action level for a residential scenario is 2 $\mu g/m^3$, and the action level for a typical industrial/commercial scenario with an 8-hr workday is 6 $\mu g/m^3$. As previously mentioned, the developmental LOC, and thus the action level, is highly dependent on the exposure time. Therefore, for non-residential exposure scenarios, careful consideration should be given to the value selected as the exposure time.

Table 2. Levels of Health Concern for Trichloroethylene ($\mu g/m^3$), THQ = 1 and TR = 1E-04.	
Residents (24-hr Exposure Scenario)	
Developmental Non-Cancer LOC:	*2*
Chronic Non-Cancer LOC:	*2.1*
Cancer LOC:	*48*
Region 7 Residential TCE Action Level:	**2**
Industrial/Commercial Workers (8-hr Exposure Scenario)	
Developmental Non-Cancer LOC:	*6*
Chronic Non-Cancer LOC:	*8.8*
Cancer LOC:	*300*
Region 7 Industrial/Commercial TCE Action Level:	**6**

Risk Management Considerations

If the TCE action level is exceeded, this indicates a potential imminent threat to human health, and early or interim action(s) should be taken to eliminate, reduce, and/or control the hazards posed by the site (EPA, 2014d). At Superfund sites, coordination between the remedial and removal programs should immediately commence as early as the receipt of preliminary sampling results indicative of a potential human health concern (EPA, 2016c). Potential receptors should be informed of the results and potential risks to human health. Standard Region 7 practice is to communicate this information via data transmittal letters submitted to property owners and employers, but when TCE action levels are exceeded, tenants, residents, employees and others who may be exposed should also be informed. Although the action levels derived in this document are applicable to women in the first trimester of pregnancy, note that the levels protective of autoimmune disease and kidney toxicity in all individuals are not significantly different, at 2.1 and 8.8 $\mu g/m^3$, for residents and workers, respectively. Depending on the concentrations detected, immediate site actions could include relocation, restricting the time residents or workers remain in areas exceeding action levels, opening basement or lower level windows for ventilation (using a fan), sealing cracks in the slab, sealing sump pits, sealing cinder block or stone walls, and/or using air filtration systems. Vapor mitigation systems or adjustments to HVAC systems may be used to minimize exposures on a more long-term basis. Post-remedy testing and continued operation and maintenance is necessary to ensure protection of human health until the source of TCE in soil and/or groundwater is ultimately addressed.

Other EPA Regions and states have derived tiered action levels prescribing the types and urgency of various responses, as described below.

- Although Region 7 consistently uses a THQ of 1 as the basis for both removal and remedial Superfund actions, other Regions have used a THQ of 3 as a science policy approach to prioritize actions that may warrant the use of removal authority, with ultimate cleanup goals based on a THQ of 1. Since non-cancer toxicity values have historically been based on effects resulting from chronic exposure, this practice assumes that the most highly contaminated sites will be remediated first, but all sites will be remediated before exposures have occurred for a sufficiently long duration (e.g., 25 years as a worker or 26 years as a resident) to pose significant health risks.

This assumption is not protective of the short-term health effects associated with TCE, in which the critical window of susceptibility is an approximate three week period and a single exposure during this critical time may result in cardiac malformations.

- Tiered action levels could also be derived by reducing the uncertainty factor applied to the RfC from 10 to 1. The existing UF of 10 is applied for uncertainty regarding differences in pharmacodynamics between animals and humans and between the general population and sensitive subpopulation. Other than the toxicokinetic variability characterized by the physiologically-based pharmacokinetic model, EPA (2011a) indicates that there are inadequate chemical-specific data to quantify the degree of differential susceptibility due to factors such as genetic polymorphisms, race/ethnicity, preexisting health status, lifestyle factors, and nutritional status. The UF of 10 was included in the extensive peer-review process described in this document, and Region 7 does not have justification to alter this value.
- Similarly, the selection of a 1% excess risk as the benchmark response and a human equivalent concentration for a toxicokinetically sensitive individual at the 99th percentile were both extensively reviewed, and Region 7 does not have justification to alter these criteria.

Although Region 7 has not developed tiered levels because this approach may not be protective of human health, higher concentrations of TCE are associated with greater health risks. Actions should be implemented as quickly as is practicable to minimize risks of developmental toxicity. This document reinforces that Region 7 should expedite actions to protect human health whenever the TCE air concentration exceeds 2 $\mu g/m^3$ in a residential scenario or 6 $\mu g/m^3$ for an 8-hour worker scenario.

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ATTACHMENT G

GLOSSARY AND ACRONYMS

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ATTACHMENT G

GLOSSARY AND ACRONYMS FOR TERMS USED IN THE PROTOCOL FOR REMEDIATION GOAL LOOKUP TABLES NEBRASKA VOLUNTARY CLEANUP PROGRAM

"adj": Designation in Table C-1, Standard Default Factors, for exposure parameters which have been calculated using an age-adjusted scenario.

Age-adjusted calculations: Performed for VCP Remediation Goal (RG) calculations for exposure pathways for which the contact rate differs between adults and children (e.g., incidental ingestion of soil). Age-adjusted rates take into account differences in ingestion rates, body weights, and exposure duration for children versus adults. Age-adjusted parameters were used in calculating the residential VCP RGs for carcinogens for all pathways for both soil and ground water. This age-adjusted approach yielded lower (more protective) VCP RGs for carcinogens than would a carcinogenic assessment of only an adult *or* a child.

ALM: Adult Lead Model. Model used to calculate the industrial VCP Remediation Goals (RG) for lead.

Anthropogenic: Describes contaminants present in the environment whose presence is due to man-made sources (e.g., automobiles). Anthropogenic contamination is typically widespread and can be the result of organic or inorganic contaminants.

AREA-ST Model: Dispersion model used for calculating the air dispersion factor (Q/C term), which is used in the volatilization factor for soil (VF_s) and particulate emission factor (PEF) equations. The AREA-ST Model is an updated version of U.S. EPA's Industrial Source Complex (ISC2) Model.

ASTM: American Society for Testing and Materials.

ATSDR ("A"): Agency for Toxic Substances and Disease Registry. A source of toxicity information; "A" is the designation for toxicity factors from ATSDR's minimal risk levels.

Background: Ambient concentrations of contaminants that are present in the environment and have not been influenced by humans. The term "background concentration" is typically reserved for metals, since metals are contaminants which are most likely to be naturally occurring.

Baseline risk assessment: An evaluation of conditions and risks/hazards to human health at a site, assuming current conditions and no controls are in place. Consists of the following steps: data collection and analysis; exposure assessment; toxicity assessment; and risk characterization.

"ca": Designation for VCP remediation goals (RG) which are based on carcinogenic effects.

CAF: Cancer adjustment factor is used to calculate the RGs for trichloroethylene. An oral factor (CAF_o) and inhalation factor (CAF_i) are used.

Cal EPA ("C): California Environmental Protection Agency. A source of toxicity information; "C" is the designation for toxicity factors from Cal EPA's Office of Environmental Health Hazard Assessment's Chronic Reference Exposure Levels and Cancer Potency Values.

Carcinogen: An agent capable of inducing cancer.

Carcinogenic risk level/target cancer risk: Additional risk of developing cancer due to exposure to a contaminant incurred over the lifetime of the individual. For the VCP remediation goals (RG), the carcinogenic risk levels are set as follows:

Type of Land Use/Scenario	Individual or Combined (Cumulative)Contaminant Exposure	Carcinogenic Risk Level
Residential	Individual	1×10^{-6}
	Combined	1×10^{-5}
Industrial	Individual	1×10^{-5}
	Combined	1×10^{-4}

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act of 1980.

Class GA: Ground water which is currently being used as a public drinking water supply or is proposed to be used as a public drinking water supply. Defined in Nebraska Department of Environmental Quality's (NDEQ) Title 118, Chapter 7.

Class GB: Ground water which is currently being used as a private drinking water supply or has the potential for being used as a public or private drinking water supply but currently cannot be classified as GA. Class GB is assigned to all ground waters in the state except those assigned to Classes GA and GC. Defined in NDEQ Title 118, Chapter 7.

Class GC(R): Ground water assigned to Class GC is not being used, and has little or no potential for being used, as a public or private drinking water supply. Class GC(R) is a subset of Class GC and represents certain portions of ground water for which the NDEQ has determined that restoration or cleanup may be appropriate to allow for attainment of future beneficial uses. Defined in NDEQ Title 118, Chapter 7.

Conceptual site model: A diagram of a site used to identify all potential or suspected sources of contamination, types and concentrations of contaminants detected at the site, potentially contaminated media, and potential exposure pathways, including receptors.

Contiguous: Sharing a boundary; touching.

COPC: Chemical of potential concern. Contaminant that has the potential to adversely affect a human receptor due to its concentration, distribution, and mode of toxicity.

COPEC: Chemical of potential ecological concern. Contaminant that has the potential to adversely affect an ecological receptor due to its concentration, distribution, and mode of toxicity.

2,4-D: 2,4-dichlorophenoxyacetic acid.

DAF: Dilution attenuation factor used in the calculation of soil-to-ground water VCP Remediation Goals (RG). Ratio of soil leachate concentration to receptor point concentration. Represents the reduction in concentration which occurs as soil leachate moves through soil and ground water, as a result of adsorption, degradation, and dilution by clean ground water. The VCP RG calculations use a DAF of 20, which, assumes that there is a 20-fold reduction in contaminant concentration between the soil sampling location and the receptor well location.

DDD: 4,4′- Dichlorodiphenyldichloroethane.

DDE: 4,4′- Dichlorodiphenyldichloroethene.

DDT: 4,4′- Dichlorodiphenyltrichloroethane.

Default values: Exposure factors which are used in calculating the VCP Remediation Goals (RG) and do not vary with the contaminant (e.g., soil ingestion rate, dermal surface area).

Dermal absorption fraction: Fraction of contaminant which is dermally absorbed from soil. Chemical-specific value.

D_i: Diffusivity in air. Chemical-specific value used in calculating the volatilization factor for soil (VF_s) term.

Exposure pathway: Course a contaminant takes from a source to an exposed organism. Includes a source area, point of exposure, and an exposure route (e.g., inhalation), as well as a transport mechanism if the point of exposure is different from the source area.

Exposure point: Location of potential contact between an organism and a contaminant.

Fate and transport: Mechanism whereby contaminants are transferred between environmental media (i.e., the volatilization factor for soil [VF_s] is a fate and transport factor which models how contaminants are transported from soil to ambient air).

GSD: Geometric standard deviation.

Ground water: Supply of fresh water found beneath the earth's surface, usually in aquifers, which supply wells and springs.

HCH: Hexachlorocyclohexane.

HEAST ("H"): U.S. EPA Health Effects Assessment Summary Tables. A source of toxicity information; "H" is the designation for toxicity factors from HEAST.

Henry's Law Constant (H): Principle that at a constant temperature the concentration of a gas dissolved in a fluid with which it does not combine chemically is almost directly proportional to the partial pressure of the gas at the surface of the fluid. Chemical-specific value used in the volatilization factor for soils (VF_s) equation.

HI: Noncarcinogenic hazard index. Sum of more than one hazard quotient (HQ) for multiple noncarcinogenic substances and/or multiple exposure pathways. See definition of HQ above for HI values used for VCP Remediation Goal (RG) calculations.

HQ: Noncarcinogenic hazard quotient. Ratio of a single noncarcinogenic contaminant's exposure level to a reference dose (RfD) or reference concentration (RfC) for that contaminant. For the VCP remediation goals (RG), the noncarcinogenic HQs and hazard indices (HI) are set as follows:

Type of Land Use/Scenario	Individual or Combined (Cumulative)Contaminant Exposure	HQ orchid
Residential	Individual	HQ = 0.25
	Combined	Target organ-specific HI = 1.0
Industrial	Individual	HQ =1.0
	Combined	Target organ-specific HI = 1.0

IEUBK Model: Integrated Exposure Uptake Biokinetic Model for Lead in Children. Model used to calculate the residential VCP Remediation Goals (RG) for lead.

Inorganic: Contaminant not containing carbon.

Institutional control: Legal instrument placed in the property records (e.g., deed notice) which indicates limitations on or conditions governing use of the property which ensures protection of human health and the environmental or equivalent zoning and governmental ordinances. For the VCP Remediation Goals (RG), mainly refers to an institutional control placed on a property stating that it is approved for industrial-commercial use only, since industrial RGs were applied to the site contaminant concentrations.

IRIS ("I"): U.S. EPA Integrated Risk Information System. Primary source of toxicity information; "i" is the designation for toxicity factors from IRIS.

ISC2: Industrial Source Complex Model.

K_d: Soil-water partition coefficient used for inorganics. Chemical-specific value used in calculating the volatilization factor from soil (VF_s) and soil-to- ground water VCP Remediation Goals (RG).

K_{oc}: Octanol-water partition coefficient used for organics. Chemical-specific value converted to a soil-water partition coefficient (K_d) used in calculating the volatilization factor from soils (VF_s) and soil-to-ground water VCP Remediation Goals (RG).

L: Liter.

L/day: Liter per day.

Laboratory detection limit: The lowest concentration of a contaminant that can reliably be distinguished from a zero concentration.

"m": Designation for VCP Remediation Goals (RG) based on the Title 118 Maximum Contaminant Level (MCL) or derived from the MCL.

m^3/kg: Cubic meter per kilogram.

m^3-yr/kg-day: Cubic meter – year per kilogram – day.

MAF: Mutagen adjustment factor is used to calculated the RGs for trichloroethene. An oral factor (MAF_o) and inhalation factor (MAF_i) are used.

"max": Designation for VCP Remediation Goals (RG) based on the non-risk-based "ceiling limit" concentration of $1 \times 10^{+5}$ mg/kg.

MCL: Maximum contaminant level in ground water, from Title 118.

µg/m^3: microgram per cubic meter

µg/L: microgram per liter

mg/kg: Milligram per kilogram.

mg-yr/kg-day: Milligram – year per kilogram – day.

MW: Molecular weight.

"n/a": Designation for volatile inorganic contaminants in the "VOC" column of the VCP Remediation Goal (RG) lookup tables. Indicates that even though these contaminants are volatile, no soil inhalation or particulate values are calculated since they are not organic contaminants.

NAPL: Non-aqueous phase liquid.

"nc": Designation for VCP remediation goals (RG) which are based on noncarcinogenic effects.

NCP: U.S. EPA National Contingency Plan.

NDEQ: Nebraska Department of Environmental Quality.

NHHSS: Nebraska Health and Human Services System.

NHL: Non-Hodgkin lymphoma

Noncarcinogen: Contaminant not believed to cause cancer, but which causes other toxic effects.

Nonvolatile: For the VCP Remediation Goals (RG), nonvolatile contaminants are defined as those having a Henry's Law Constant (H) less than or equal to 1×10^{-5} atm-m^3/mole and a molecular weight (MW) greater than or equal to 200 grams/mole.

NVCP RG: Nebraska Department of Environmental Quality (NDEQ) Voluntary Cleanup Program Remediation Goal. Term for Tier 2 soil and ground water concentrations calculated using the methods described in the protocol.

"O": Designation for factors from nonstandard ("other") U.S. EPA sources.

Oral absorption factor: Used in the dermal soil contact pathway. Factor estimating gastrointestinal absorption used to modify the oral toxicity factor for use in the dermal pathway.

ORD: U.S. EPA Office of Research and Development.

Organic: Contaminant containing carbon.

OSWER: U.S. EPA Office of Solid Waste and Emergency Response.

PAH: Polycyclic aromatic hydrocarbon.

PCB: Polychlorinated biphenyls.

PEF: Particulate emission factor.

PFOA: Perfluorooctanoic acid.

PFOS: Perfluorooctanesulfonate.

pica: Abnormal appetite in children for consuming large amounts of soil.

PM_{10}: Particulate matter of 10 microns (µm) or less in diameter.

PPRTV ("P" and "X"): U.S. EPA Provisional Peer-Reviewed Toxicity Values. Source of toxicity information; "P" is the designation for toxicity factors which are the PPRTVs derived by U.S. EPA's Health Risk Technical Support Center for the U.S. EPA Superfund Program. Source of toxicity information, "X" is the designation for toxicity factors which are the values derived from the PPRTV Appendix.

Q/C: Air dispersion factor used in the volatilization factor for soil (VF_s) equation and the particulate emission factor (PEF).

RAC: Remedial action class from Title 118.

RAC-1: Remedial action class 1 from Title 118. Includes ground water of Class GA and a portion of Class GB, a 500-foot radius around all private drinking water supply wells. RAC-1 ground water receives the most extensive remedial action measures.

RAC-2: Remedial action class 2 from Title 118. Includes ground water of Class GB (except for the portion of Class GB placed in RAC-1) and Class GC(R).

RAC-3: Remedial action class 3 from Title 118. Includes, but is not limited to, ground water of Class GC—except for Class GC(R) that was placed in RAC-2. RAC-3 ground water receives the least extensive remedial action measures.

RAGS: U.S. EPA Risk Assessment Guidance for Superfund.

RBCA: Risk-based Corrective Action.

RCRA: Resource Conservation and Recovery Act.

Receptor: Organism potentially receiving a contaminant exposure. For the purposes of the VCP Remediation Goals (RG), receptors evaluated include residents (adults and children) and industrial-commercial workers (abbreviated as "industrial").

RfC: Chronic reference concentration. Toxicity factor used to estimate noncarcinogenic hazard from inhalation exposures to site contaminants. An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

RfD: Chronic reference dose. Toxicity factor used to estimate noncarcinogenic hazard from oral and dermal exposures to site contaminants. An estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime.

RG: Remediation Goal.

RSL: U.S. EPA Regional Screening Level.

"s": Designation for VCP remediation goals (RG) which are based on the soil saturation limit.

Safe Drinking Water Act: Passed in 1974, aims to ensure that public drinking water supplies meet national standards which protect consumers from harmful contaminants in drinking water.

SARA: Superfund Amendments and Reauthorization Act of 1986.

SEAM: Superfund Exposure Assessment Manual.

SF: Cancer slope factor. Toxicity factor used to estimate cancer risk due to oral and dermal exposures to site contaminants. An upper bound, approximating a 95% confidence limit, on the increased cancer risk from a lifetime exposure to an agent. This estimate, usually expressed in units of proportion (of a population) affected per mg/kg/day, is generally reserved for use in the low-dose region of the dose-response relationship, that is, for exposures corresponding to risks less than 1 in 100.

Site-specific: Pertaining to a particular location (i.e., contaminated site). Relevant site-specific parameters include, but are not limited to organic carbon content of soil, depth to ground water, mean annual windspeed, etc.

Soil saturation limit: Measure of the contaminant concentration at which all soil pore space (both air- and water-filled) is saturated with the contaminant and the adsorptive limits of the soil particles have been reached. Represents an upper bound on the applicability of the volatilization factor in soil (VF_s) model, because contaminants exceeding the saturation limit may be present in free phase, which would violate a key principle of the model (i.e., that Henry's Law applies).

Soil to ground water: Migration of contaminants from soil to underlying ground water, through leaching.

Surface water: Above-ground water bodies (e.g., lakes, rivers).

SVOC: Semivolatile organic compound.

Target organ: The biological organ(s) most adversely affected by exposure to a chemical, physical, or biological agent.

TCDD: Tetrachlorodibenxo-p-dioxin.

TCE: Trichloroethylene.

Tier 1: Under VCP, comparison/remediation to background concentrations.

Tier 2: Comparison/remediation to VCP Remediation Goals (RG).

Tier 3: Development of and comparison/remediation to site-specific VCP Remediation Goals (RG) by the participant, under oversight by NDEQ.

Title 118: NDEQ Ground Water Quality Standards and Use Classification.

Ubiquitous: Widespread; present virtually everywhere.

U.S. EPA: U.S. Environmental Protection Agency.

URF: Unit risk factor. Toxicity factor used to estimate cancer risk due to inhalation exposures to site contaminants. The upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 $\mu g/m^3$ in air.

VCP: Voluntary Cleanup Program.

VF_s: Volatilization factor for soil inhalation pathway. Calculated, chemical-specific value for volatile organic compounds (VOC).

VF_w: Volatilization factor for ground water inhalation pathway. Default value previously derived using chemical-specific information; used for volatile organic compounds (VOC).

VOC: Contaminant which is considered to be a volatile organic compound. For the VCP Remediation Goal (RG) lookup tables, VOCs are defined as contaminants having a Henry's Law Constant (H) greater than 1×10^{-5} atm-m^3/mole and a molecular weight (MW) less than 200 grams/mole.