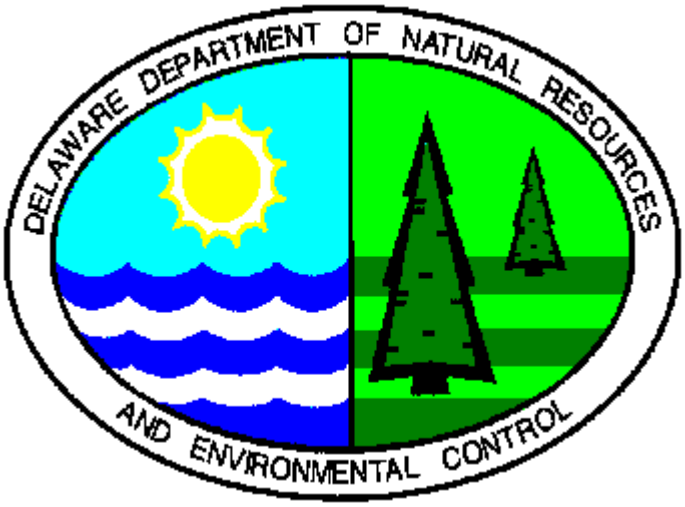
REMEDIATION STANDARDS GUIDANCE UNDER THE DELAWARE HAZARDOUS SUBSTANCE CLEANUP ACT



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1.0 INTRODUCTION

1.1 BACKGROUND

Delaware is one of the growing number of states to address, through statutes, the liability issues associated with buying, selling, or developing property contaminated by hazardous substances. Because of the potential for liability as an owner of property contaminated with hazardous substances, property owners and other participants in property transactions (buyers, developers, and their financial institutions) frequently need to determine if a property they are interested in is contaminated. When contamination is discovered, participants in property transactions want to know what contaminant levels pose a potential human health or environmental concern, as well as the cleanup levels that will ultimately be required to address the environmental problem.

To address this need, the Delaware Department of Natural Resources and Environmental Control Division of Air and Waste Management, Site Investigation and Restoration Branch (hereinafter referred to as the Department or SIRB) has previously developed generic contaminant screening levels which can be used to determine if a site requires further investigation or cleanup consideration (Interim Guidance on Reporting Levels of Hazardous Substances Discovered During Site Assessments Under the Delaware Hazardous Substance Cleanup Act, March 1996). These screening levels have been a very successful tool in streamlining the investigation of affected properties, and have also been used as cleanup standards on occasion.

Although the screening levels have been used as cleanup standards on a case-by-case basis, there were no formal guidance on the development and application of cleanup standards beyond the screening levels. The lack of formal cleanup standards guidance can be a contributing factor to the delays that can be encountered in the cleanup process, which can hinder, or even prevent, property transactions or development.

In an effort to further streamline the cleanup of contaminated sites in Delaware, the Department has developed remediation standard guidance for hazardous substance releases considered under 7 Del. C., Chapter 91, the Delaware Hazardous Substance Cleanup Act (HSCA) and the Voluntary Cleanup Program (VCP). **The remediation standards are to be considered initially as guidance only. Based on the eventual experience and success of this guidance, the Department may propose the standards for promulgation at some point in the future, if necessary. Any regulatory consideration will be afforded the appropriate level of public comment and participation as required by Delaware law.**

These standards were initially developed based on the critical review of remediation standards and approaches that are in use in other states and/or federal environmental programs. Draft standards were submitted for public comment in June 1997, and comments were received through November 1997. Over 155 comments were received, and the document was revised and published by DNREC originally in February 1998.

1.1.1 AUGUST 1999 REVISION SUMMARY

The August 1999 Revision #1 is the first update of the February 1998 document, and includes the following general changes:

- The Uniform Risk-Based Remediation Standards (URS) for the protection of human health have been updated to reflect changes in the most recent version (April 1999) of the EPA Region III Risk Based Concentration (RBC) Tables, which are the primary basis for the URS. The revised URS now includes a total of 428 analytes – 170 analytes were deleted from the original February 1998 URS list, and 10 new analytes have been added (see Attachment 3 for details).

- The URS no longer include values that have been modified to reflect practical quantitation limits (PQLs). Appropriate risk-based values considered protective for human health and the environment are now presented for all analytes. This change is based on the determination that PQLs are not an acceptable basis for setting remediation criteria since they are not related to actual environmental impacts. However, the Department considers PQLs to be appropriate for determining attainment with the URS. For the purposes of demonstrating attainment, applicable PQLs for analytes with low URS values (i.e. values less than 0.1 ug/l or 0.5 mg/kg) are presented in Attachment 5.

- Maximum ceiling value URS for various inorganic analytes have been eliminated. The URS for these analytes is the value derived from the EPA RBC table. All URS remain protective of human health and the environment.

- EPA has published new human health risk assessment guidance (RAGS Part D) which is applicable to the Site-Specific Standard (SSS) approach. References for this guidance are included in Attachment 4.

- The Department reiterates its discretion to require a site-specific risk assessment for any site where conditions warrant further consideration as a result of future land-use, nature and extent of contamination, and other special considerations.

- The risk calculator prepared as a supplement to this remediation standards guidance document has been revised to incorporate the updated list of analytes, equations, and toxicological constants.

- The URS for the protection of the environment have also been updated to reflect changes in the most recent version of the Oak Ridge National Laboratory (ORNL) May 1998 Screening Levels for Eco Risk Assessment. The URS have also been modified, where applicable, to include EPA's National Recommended Water Quality Criteria, published in December 1998.

- In accordance with the new EPA National Recommended Water Quality Criteria guidance, dissolved metals data are now required for surface water assessment and demonstration of

attainment. Total metals data, which were formerly required as described in the February 1998 Remediation Standards Guidance, are no longer applicable for surface water assessment with respect to the URS.

- The internet address to download the DQO-PRO environmental calculator program has been updated: http://www.acs-envchem.duq.edu

- The guidance now includes a recommendation that all initial site investigation sampling programs include a minimum number of samples from each media to be investigated. This will ensure that sufficient data are collected to perform statistical analysis to support evaluation of the site. The general guidance provided in Section 3.2 (Background Sampling) and Section 6 (Demonstration of Attainment), is applicable to the determination of the minimum number of samples that should be collected from each media to evaluate a site.

1.2 APPLICABILITY

At present, this remediation standard guidance applies only to those releases considered under 7 Del. C., Chapter 91, the Delaware Hazardous Substance Cleanup Act (HSCA) and the Voluntary Cleanup Program (VCP). It is expected that the remediation standards and guidance will be periodically updated to reflect scientific assumption changes and experience with the program. This guidance is consistent with all provisions of the HSCA regulations and is not intended to replace or contradict any requirements of the regulations.

However, it is the Department's intent for this guidance to eventually become applicable, at some point in the future, to every DNREC Division of Air and Waste Management cleanup program (including underground storage tank, RCRA, and solid waste programs), so that the regulated community has a single consistent set of standards to consider. The current general approach to cleanup in the other Department programs, including Solid Waste and Hazardous Waste Management, UST, and Environmental Response Branches are included in Attachment 1 for comparison purposes.

A flow-chart illustrating the general overall HSCA and VCP cleanup process for applicable sites in Delaware is presented on Figure 1. The responsibilities of the Department and interested party in each step in the cleanup process are highlighted where applicable. The remediation standards presented in this document are intended to be incorporated into Step 7 (Cleanup Standard Approach) of this cleanup process.

The role of public participation in the application of these remediation standards will be in accordance with Section 12: Public Participation, of the Delaware Regulations Governing Hazardous Substance Cleanup. Remediation standards proposed for a given site will be included in the Proposed and Final Plan of Remedial Action. Further, the Department is committed to provide information about cleanup activities to the public, as requested, through the Delaware Freedom of Information Act.

1.3 PURPOSE

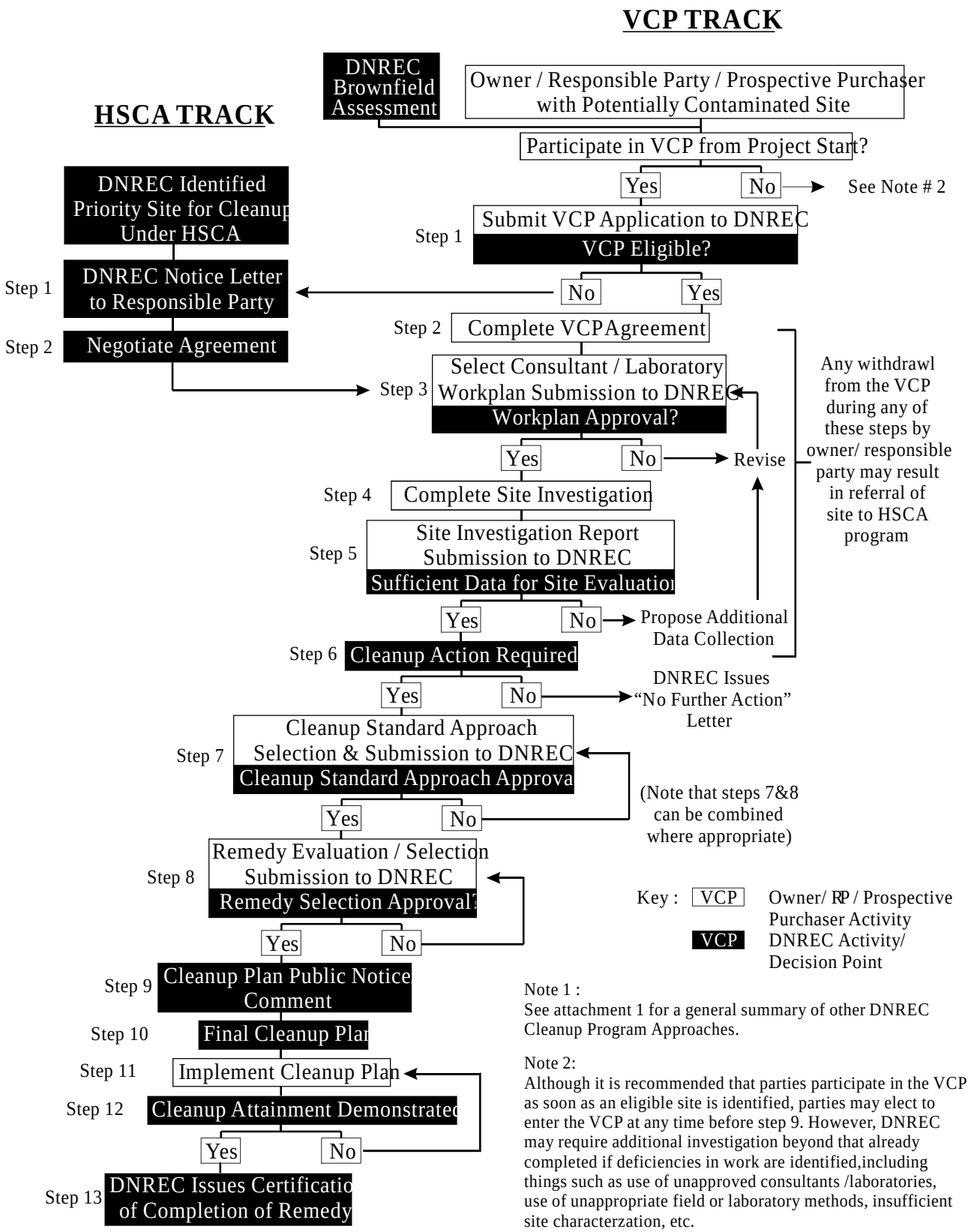
The purpose of this document is to provide detail and specificity on the important elements of the remediation standards guidance, including responsibilities of responsible parties and the Department, and general investigation and demonstration of attainment requirements. This guidance is also intended to be a technical supplement for other Department programs (including the VCP, Brownfield Redevelopment Initiatives Task Force, DNREC-EPA Brownfield Assessment Program, and others) which are being implemented to promote and encourage the reuse of brownfields sites throughout Delaware. References for these programs should be consulted for more information about brownfield development incentives.

One of the main features of the VCP and Brownfield Program are that all prospective purchasers and developers of contaminated properties are released from all liabilities under HSCA, provided they cleanup the site and receive a certificate of completion of remedy for the site from the Department.

The information contained in this document is intended solely for guidance. Parties using this guidance should be aware that there are acceptable alternatives to this guidance for achieving compliance with regulatory requirements. Further, nothing in this document should be viewed as limiting or eliminating the need for the exercise of good professional judgment.

Delaware Cleanup Approach Under HSCA

(See Note # 1)



Note 1 :
See attachment 1 for a general summary of other DNREC Cleanup Program Approaches.

Note 2:
Although it is recommended that parties participate in the VCP as soon as an eligible site is identified, parties may elect to enter the VCP at any time before step 9. However, DNREC may require additional investigation beyond that already completed if deficiencies in work are identified,including things such as use of unapproved consultants /laboratories, use of unappropriate field or laboratory methods, insufficient site characterzation, etc.

2.0 REMEDIATION STANDARDS

Contaminated sites vary greatly in complexity with regard to site conditions and in the risk these sites pose to human health and the environment. Evaluation of these risks and determination of the most appropriate remediation approaches to address or manage these risks will include the establishment of acceptable remediation standards.

To provide flexibility in the Delaware cleanup program, three remediation standard options have been developed. Each remediation standard option is intended to ensure protection of human health and the environment, but will differ in the level of administrative oversight and technical sophistication required for implementation. In addition, the Department has also established different levels of liability release for each remedial standard option (a detailed discussion of the level of liability release for each standard option is included in each respective section). This will enable responsible parties to tailor assessment and remediation activities to specific site and community needs in a more flexible and cost-effective manner. The three applicable remediation standard options are:

Background Standard (BGS) - This standard approach is useful at sites where future site development restrictions are undesirable or where the contamination area is small. The goal in this approach is to demonstrate that the site has been remediated to levels which are equivalent to levels that would be expected at a site where no release of hazardous substances has occurred. Attainment of the default background standard will provide for a complete release of liability (such as through a Covenant Not to Sue agreement). A complete release of liability will also be considered on a case-by-case basis for cleanup to site-specific background standards, based on the levels of background contaminants.

Uniform-Risk Based Standard (URS) - This standard approach is useful for sites where it is not possible or cost-effective to achieve background standards because of the volume of the contamination or a site-specific risk assessment was not performed (i.e., a simplified evaluation of site-specific risks is more appropriate and cost effective than a baseline risk assessment). Attainment of the uniform risk standard will provide a limited level of liability release. This may include complete release of liability on a case-by-case basis for cleanups attaining the unrestricted use URS. Also, the Department will not require any deed notice or restriction for cleanups attaining the unrestricted use URS.

Site-Specific Standard (SSS) - This standard approach is appropriate in lieu of the Background or Uniform-Risk Based options. Specifically, this approach is appropriate for sites that do not meet the assumptions used to derive or conditions applicable to the URS, or sites that contain substances in any media which are not listed in this document. It is also applicable to sites with multiple contaminated media beyond soil or ground water (i.e. sediment, surface water, air, biota, etc.). Based on the actual magnitude of the SSS, attainment of the site-specific standard could provide a variable level of liability release ranging from deed restrictions and/or notice and future land-use limitations to no restrictions on the deed or land-use restrictions.

The remediation standard option to be used at a site is selected by the party initiating the remediation, subject to DNREC approval. It is important to note that these options are not tiered; a party is not obligated to use one standard prior to use of another. The options may be used alone or in combination unless otherwise required by DNREC. For example, a site may use a combination of the three standards in different areas of a site and for different chemicals of concern within the same or different areas. However, only one standard shall be applied to a media unless otherwise directed by the Department. The basic goal is to establish a continuum of options for establishing the most cost-effective objectives for protecting human health and environment.

Regardless of the remediation standard approach selected, certain environmental conditions, including the presence of non-aqueous phase (separate or free) product, hazardous waste (as defined by applicable hazardous waste regulations), and soil hot spots (defined as localized soil areas that would be characterized as hazardous waste if removed from the site, and/or soil areas containing concentrations of contaminants which pose a risk of greater than 1 x 10E-4 for carcinogenic compounds or a hazard index of 10) will always warrant further evaluation, and action, if appropriate, including removal, to protect human health and the environment.

Recognizing that remediation standards have limited usefulness if the site values are not derived by a comparable means, **it is recommended that the design of site sampling programs be done in consultation with the Department early and throughout the site assessment process. <u>As a starting point, it is recommended that the general guidance included in Section 3.2 (Background Sampling) or Section 6 (Demonstration of Attainment), be used to determine the minimum number of samples to be collected from each media of interest.</u>** This will ensure that the most appropriate sampling and statistical approaches are used to support the determination of whether or not remediation is required at a given site, and the subsequent implementation of these standards, if applicable. This will also prevent the requirement for resampling or additional investigation should the Department become involved in the post-investigative phase and determine the data to be insufficient to render a decision about a given site. Recommended investigation guidance to consider as part of any site characterization activities is included in Attachment 2. Further, a key component to the investigation guidance is a new ecological screening step to determine if a site requires a more detailed evaluation of ecological risks.

The following general guidelines should be considered when using this guidance:

- All soil and sediment standards are considered dry weight basis.
- All aqueous standards are considered total concentration for water supply sample data (either ground water or surface water), and dissolved concentration for non-water supplyground-water <u>and surface water</u> sample data.
- An area is defined as "contaminated" (for the purposes of this guidance) if a listed substance is present at a concentration that exceeds the remediation standard selected by the responsible party.
- Attainment requirements in this guidance apply to the vertical and horizontal extent of soil/sediment identified as "contaminated" and of ground-water/surface water at the point of compliance and beyond.
- If a substance is detected at a site for which no URS are presented in this guidance (including tentatively identified compounds (TICs)), the SSS approach will be required to determine the appropriate remediation standard, if remediation is required.

3.0 BACKGROUND STANDARD

The background standard (BGS) may be applied to any site, but may be most applicable to sites where future site development restrictions are undesirable or where the contamination area is small. In addition, the BGS is also applicable to sites which may have been impacted from natural sources or local and regional anthropogenic sources that are not attributable to current or historical practices (characteristics) unique to the site of interest. There are two background standard (BGS) approaches: default BGS approach and a site-specific BGS approach. **Both approaches are applicable to the protection of human health and the environment.**

Sites where default background standards are attained will be allowed unrestricted use, no deed restrictions, and complete release of liability (such as through a Covenant Not to Sue agreement). Sites where site-specific background standards are attained may also be afforded a complete release of liability, however, restricted use or deed restrictions or other risk management measures **may be required** on a case-by-case basis to protect human health and the environment in situations where the site-specific BGS approaches or exceeds the applicable (i.e. restricted or unrestricted use) URS. For sites with a site-specific BGS less than the URS standards, the level of liability release associated with the URS may apply. For sites with a site-specific BGS greater than the URS standards, the level of liability release associated with the SSS may apply.

3.1 DEFAULT BACKGROUND STANDARD APPROACH

The default BGS are intended to be generic concentrations that are considered to be reasonably attributable to natural or regional anthropogenic sources statewide.

The default BGS approach uses practical quantitation limits (PQLs) as the BGS for organic substances (as most are not assumed to be naturally occurring) and derived values as the BGS for inorganic substances. The PQLs applicable to the BGS are those which are associated with the various analytical methods described in the DNREC Standard Operating Procedures for Chemical Analytical Programs (SOPCAP) under HSCA (last revised May 1995); the BGS is the lowest attainable PQL for a given analyte using established methods in the SOPCAP. However, if a particular contaminant is known to be present, and the SOPCAP method does not provide a sufficient practical quantitation limit which is less than or equal to the URS for that contaminant, then other analytical methods may be required by the Department to meet the data quality objectives regarding quantitation limits.

The default background values for inorganics are presented in Attachment 3. The aqueous media values represent the lowest of either the ground water or surface water uniform risk-based standard (URS) for a given analyte. The soil values represent average concentrations of inorganics detected in background samples collected as part of HSCA investigations throughout the State of Delaware in rural and urban locations over the last few years. The sediment values represent the sediment URS, or lowest background soil value where no sediment URS is available for a given analyte.

3.2 SITE-SPECIFIC BACKGROUND STANDARD APPROACH

The site-specific BGS are intended as the concentrations that represent natural or local and regional anthropogenic sources in the vicinity of a given site, as well as reflect the site-specific variability in the soil and geologic conditions. **As stated previously, sites where site-specific**

background standards are established and attained may be afforded a complete release of liability depending on the actual level of background contamination. However, in cases where the site-specific BGS approaches or exceeds the applicable URS (either restricted or unrestricted use), restricted use or deed restrictions similar to those applied to URS or site-specific standard sites may be necessary to protect human health and the environment.

The site-specific BGS are derived based on the collection of a sufficient number of samples and subsequent statistical analysis to determine background concentrations based on levels of naturally occurring substances and concentrations of regulated substances originating from sources on other properties. Given that there are various methods for determining site-specific background concentrations, the basis for the selection of what concentration constitutes an appropriate site-specific BGS will vary based on the statistical methodology selected, other site factors, and most importantly, professional judgment.

Therefore, it is recommended that the approach to developing site-specific background standards for a given site, including sample location selection and statistical method selection, be submitted for Department review, concurrence, and approval. **Although there is no requirement for pre-approval, and the responsible party can proceed without Department concurrence, the Department can reject the background sampling results and require resampling if it does not concur with the approach used.**

General guidelines for determining the number of samples, appropriate sample locations, and statistical approaches to derive site-specific BGS follow.

3.2.1 Number of Samples

The minimum number of data points required to establish background concentrations that will be used as site-specific background remediation standards in any given media is 10. For large sites (e.g. >5 acres) or sites with complex conditions (e.g. highly variable physical setting), the most appropriate number of data points (>10) required to establish representative background concentrations should be determined by a pre-approved statistical methodology (EPA guidance - see reference listing in Attachment 4) that is consistent with the methodology that will be used to demonstrate attainment of the site-specific background standard.

It should be noted that the number of data points is not necessarily synonymous with the number of sample locations. Although it may be reasonable to identify 10 separate sample locations for evaluating background soil conditions at most sites, identifying or providing 10 separate ground-water sample locations for evaluating background ground-water conditions could be more difficult to accomplish in some situations. It is recommended that the maximum number of sample locations be used, where feasible, for each media of concern. For soil and sediment, this is generally feasible to accomplish. For ground water, the use of direct-push sampling techniques to collect ground-water samples, or multiple rounds of ground-water sampling from monitoring wells are recommended approaches to provide the necessary minimum number of data points.
This sample number is considered to be the minimum number needed to perform reasonable inferential statistics on the data set, if necessary, regardless of the size of the site. The approach

for larger sites acknowledges that a more rigorous analysis of background data is appropriate at larger or more complex sites, hence the requirement for more detailed assessment at these sites. Since site-specific background concentrations are a remediation standard, it is very important to have sufficient confidence in the measures of central tendency for the background data set, as well as the measures of variability for the background data set.

The Department recognizes that a smaller number of samples may be sufficient to establish background concentrations under certain site-specific situations. For example, sites that exhibit low data variability (such as a coefficient of variation less than 0.5) or well documented homogeneous conditions may be suitable for a background determination based on fewer than 10 samples. Consequently, the Department will consider a site-specific alternative background sampling approach consisting of fewer than 10 samplepoints on a case-by-case basis. However, any variance request will have to be supported by a reasonable site-specific database and inferential statistical analysis to demonstrate low data variability and homogeneity.

3.2.2 Sample Location Considerations

The focus of the selection of background sample locations should be in the identification of areas that are not related to obvious contamination areas on a given site, coupled with prudent professional judgment. Ideally, background sample locations for any media should be free of any contamination originating from a release at a target site. However, in certain situations where all areas of a site are affected by a release, off-site background locations may be appropriate. A random sampling approach is required to collect samples from within the area considered for evaluation of background conditions (either on-site or off-site).

Media-specific background sampling considerations include:

- *Ground Water*: Background ground-water samples should be collected from an area that is hydraulically upgradient of a site. Samples should be collected from an aquifer setting that is the same as that present at the site.

- *Soil*: Background soil samples should be collected from an area where soil conditions are similar to those found at the site. Samples should be collected from the same depth as those soil samples collected at the site, and have similar physical properties, including grain size (texture), color, mineralogy, moisture content, organic carbon content, gradation, and plasticity.

- *Surface Water*: The collection of background samples in a surface water body will vary depending on the type of water body. In the case of rivers or streams, the background samples should be collected from a physically similar location upstream of the site. In the case of a lake or pond, the background samples should be collected from an appropriate and similar water body elsewhere in the drainage basin, if possible. Samples should also be collected from the same depth as those surface water samples collected at the site.
- *Sediment*: The collection of background sediment samples will vary depending on the type of water body. In the case of rivers and streams, the background samples should be collected

from a physically similar location (e.g. with similar current velocity and depositional features) upstream of the site. In the case of a lake or pond, the background samples should be collected from an appropriate and similar water body elsewhere in the drainage basin, if possible. Sediment samples should have similar physical properties, including grain size (texture), color, mineralogy, organic carbon content, gradation, and redox status.

3.2.3 Statistical Analysis - Determination of Representative Background Concentrations

At a minimum, the following statistical parameters should be calculated for each substance in the background data set for each media of concern: mean, geometric mean, median, and mode, which are all measures of central tendency; range, extremes (maximum and minimum); variance, standard deviation, standard error, and coefficient of variation, which are all measures of variability of the data set; and the 95% upper confidence level (UCL) of the arithmetic mean. To facilitate statistical analysis, the PQL reported by the laboratory for each sample shall be used as the respective concentration for all substances that were not detected. **All soil data used for calculations should be reported on a dry weight basis**.

Based on a review of the background data set summary statistics, the site-specific BGS will be determined based on the variability of the data, and can be any of the following:

- The maximum concentration detected in the background samples provided the concentration is less than the relevant uniform risk-based standard (URS) for a given analyte.

- The 95% upper confidence level of the arithmetic mean concentration detected in the background samples if the coefficient of variation (CV) for the background data set is less than 0.5.

- An adjusted 95% upper confidence level of the arithmetic mean concentration which reflects an evaluation of outlier data if the CV for a data set is greater than 0.5. Outlier analysis can include: a simple calculation of the 95% UCL of the arithmetic mean of the interior of the data set (which excludes a percentage of the data points equally from the top and bottom tails of the data set - maximum percentage of sample points that can be excluded is 20% - for example, for a data set containing 10 samples, the lowest concentration and highest concentration data points would be excluded from the calculation of the mean); or a more robust procedure for outlier analysis (see Attachment 4 for relevant references).

- Some other statistical measure using a method pre-approved by the Department.

4.0 UNIFORM-RISK BASED STANDARD

The uniform risk standard approach is useful for sites where it is not possible to achieve background standards because of the volume of the contamination or a site-specific risk assessment was not performed (i.e., a simplified evaluation of site-specific risks is more appropriate and cost effective than a baseline risk assessment). Attainment of the uniform risk standard will provide a limited level of liability release. This may include complete release of liability on a case-by-case basis for cleanups attaining the unrestricted use URS. Also, the Department will not require any deed notice or restriction for cleanups attaining the unrestricted use URS.

Uniform-risk based standards have been developed for the protection of human health and the environment -- separate standards have been developed for each. The URS approach is intended to be a generic conservative approach to the protection of human health and the environment, and as such, does not take into consideration site-specific elements which change the assumptions used to derive the URS values. Site-specific elements are considered in the site-specific standard approach methodologies discussed later in this document.

The URS are also intended to replace the Interim Guidance on Screening Levels for Hazardous Substances Discovered during Site Assessments Under the Delaware Hazardous Substance Cleanup Act (last revised March 1996) as a site assessment screening tool. It is recommended that any substance detected at concentrations in exceedance of the applicable URS be reported to the Department's Site Investigation and Restoration Branch as soon as practicable, and that interested parties participate in the Department's Voluntary Cleanup Program (VCP) to determine if further investigation and action is warranted.

4.1 DEFINITIONS

Definitions which are important to, and **exclusively applicable to the implementation of the URS** follow:

Restricted Use Setting: A restricted use setting is any setting where current or future use will be restricted in some way (either through deed restriction, risk management or engineering control measures) to ensure the protection of human health. A restricted use setting will have, at a minimum, a land-use which provides a human health exposure scenario that is consistent with the exposure scenario assumed by EPA to derive the human health RBC values for industrial soil ingestion, which are the basis for a portion of the URS (see April 1999 RBC Table Background Information for description of exposure scenario). Restricted use settings would typically include any setting on which commercial, industrial, manufacturing, agriculture, or any other activity is done to further either the development, manufacturing, or distribution of goods and services, intermediate and final products, including but not limited to: administration of business activities, research and development, warehousing, shipping, transport, remanufacturing, stockpiling of raw materials, storage, repair and maintenance of commercial machinery and equipment, and solid waste management.

Unrestricted Use Setting: An unrestricted use setting is any setting where current or future use will not be restricted in any way to ensure the protection of human health. An unrestricted use setting will have a land-use which provides a human health exposure scenario that is consistent with the exposure scenario assumed by EPA to derive the human health RBC values for residential soil ingestion, which are the basis for a portion of the URS (see April 1999 RBC Table Background Information for description of exposure scenario). Unrestricted use settings would typically include residential landuses, as well as landuses where there is potential for more extensive soil ingestion, such as playgrounds, recreational areas, parks, etc. Unrestricted use settings could also include agricultural landuse associated with the propagation of vegetation or livestock under certain conditions.

Surface Soil: Surface soil is all soil between the land surface and a depth of 2 feet below grade.

Subsurface Soil: Subsurface soil is all unsaturated soil between 2 feet below grade and the seasonally-low water table surface, bedrock, or 15 feet below grade, whichever is less.

Critical Water Resource Area: A critical water resource area is:

- Any area within a designated New Castle County Water Resource Protection Area (WRPA) or other areas in New Castle County within any delineated wellhead or ground-water protection area;
- Any area in Kent or Sussex County within any delineated wellhead or ground-water protection area as mapped by DNREC or other state or local government entity;
- Any area within 500 feet of a public or private water supply well; and
- Any area within 500 feet of a public or private surface water supply source.

Non-Critical Water Resource Area: By default, a non-critical water resource area is any setting that does not meet the definition of a critical water resource area.

Ecologically Sensitive Areas: An ecologically sensitive area is an area that has been identified to be of some ecological importance. The following are considered ecologically sensitive areas:

1. Critical Habitat, including breeding areas, migratory areas, and wintering areas for State or Federal designated endangered or threatened species, or habitat known to be used by designated, proposed, or under review endangered or threatened species.
2. Federal or State Park, Preserve, Forest, Wildlife Refuge or other Federal or State administered natural or recreational area, as well as other recognized parklands, open space, or other mapped natural areas managed by local government, non-profit organizations, or others.
3. Coastal Barrier, both developed and undeveloped, including private and public beaches
4. Spawning, migration, and feeding areas critical for the maintenance of anadromous fish/shellfish species within river, lake, or coastal tidal waters
5. Wetlands and waterways, including associated floodplains and riparian zones
6. Recognized critical habitats for State listed species having the Delaware Natural Heritage Program Ranking of S1, S2, S3, S4, SU, SH, SX, and SE.
7. Woodlands/forest in excess of 20 acres in size

A listing of references/sources that are available to assist in the identification of these sensitive areas is included in Attachment 2.

4.2 PROTECTION OF HUMAN HEALTH URS

The human health URS for ground water, and the surface soil and subsurface soil for both restricted and unrestricted use settings in critical and non-critical water resource areas are included on Attachment 3. Any substance not listed in Attachment 3, including tentatively identified compounds (TICs) must be addressed using the site-specific standard approach.

The risk scheme used to derive the URS values is varied and is summarized as follows:

- *Ground-Water URS* - The ground-water URS reflect a combination of standards, predominantly including EPA maximum contaminant levels, health advisory limits, other miscellaneous guidelines, and values derived to reflect a carcinogenic risk of 1 in 1,000,000 and a non-carcinogenic hazard index of 0.1.

- *Critical Area Unrestricted and Restricted Surface and Subsurface Soil URS* - The unrestricted and restricted surface and subsurface soil URS reflect a combination of standards for protection of the ground water as well as for protection of human health. For ground-water protection, the URS have been derived from a generic multiplication of the ground-water URS by 100, or from soil-to-ground water equations. For analytes where the ground-water protection values are not sufficiently protective of human health, the values are derived in the same way as described for the non-critical area surface and subsurface soil below.

- *Non-Critical Area Unrestricted and Restricted Surface and Subsurface Soil URS* - The unrestricted and restricted surface and subsurface soil URS for non-critical areas reflect a combination of standards, including EPA soil screening levels for compounds with inhalation concerns, other miscellaneous guidelines, and values derived to reflect a carcinogenic risk of 1 in 1,000,000 and a non-carcinogenic hazard index of 0.1. This risk and hazard index basis is considered protective in the surface soil and subsurface soil settings.

The items in the URS legend pertaining to human health, which identify the basis for the calculation of the URS values, is further expanded below.

Human Health URS Table Legend Definitions:

CALA - Soil standards indexed with this acronym have been derived by multiplying the ground-water URS times 100. This is a general protection factor derived for all analytes for critical water resource areas.

CALB - Soil standards indexed with this acronym have been derived by using a soil to ground-water equation instead of the CALA approach. These equations are used for compounds or analytes for which the CALA calculation resulted in values which are overly protective or conservative given the fate and transport characteristics of the analyte. This approach was generally applied for analytes that have a strong affinity for the soil (such as metals, PAHs, PCBs, etc.).

One of the following soil to ground-water equations was used to derive the CALB values:

Organic Compounds:

Critical Water Resource Area Soil URS = Ground-water URS * ((Koc *foc)+ (PW/Yb)) * DF

where:

Koc	=	organic carbon partition coefficient for a regulated substance (l/kg)
foc	=	fraction of organic carbon in the soil (default value = 0.0025)
PW	=	water filled porosity of soil (default value = 0.2)
Yb	=	dry bulk density of soil (default value = 1.8 kg/l)
DF	=	dilution factor (default value =100)

Inorganic Analytes:

Critical Water Resource Area Soil URS = Ground-water URS x (Kd + (PW/Yb)) x DF

where:

Kd	=	soil to water partition coefficient for the inorganic related substance (l/kg)
PW	=	water filled porosity of soil (default value = 0.2)
Yb	=	dry bulk density of soil (default value = 1.8 kg/l)
DF	=	dilution factor (default value =100)

The use of site-specific data for bulk density, fraction of organic carbon, and porosity in these equations is one approach that can be used to develop site-specific standards under the modified URS methodology included in the Site-Specific Standard section of this document.

EPA - Standards indexed with this acronym are obtained from relevant EPA guidance or recommendations. Lead and total PCB's are the only analytes on the list currently with this designation.

HAL - Ground-water standards indexed with this acronym are current drinking water health advisory levels (HAL) published by EPA. The HALs are informal technical guidance published by EPA and do not represent final EPA action.

MAG - Standards indexed with this acronym are the standards used by the State of Massachusetts that have been adopted for use by DNREC exclusively for total petroleum hydrocarbons (TPH). **The use of these standards requires TPH data obtained using volatile petroleum hydrocarbon (VPH) and extractable petroleum hydrocarbon (EPH) analytical methods (new guidance for TPH sample collection and analyses will be forthcoming from the Department in the future).**

MAX - Standards indexed with this acronym are ceiling values for organic compounds in soil. Ceiling values of 1,000 mg/kg and 5,000 mg/kg are used for unrestricted and restricted surface soil and subsurface soil URS. Ceiling values are used to address issues regarding odor thresholds, inhalation, and dermal exposure risks (Soil RBC values, which are the basis for most of the URS, are exclusively derived for the soil ingestion pathway). No ceiling values are provided for inorganic analytes.

MCL - Standards indexed with this acronym are current EPA-promulgated maximum contaminant levels (MCLs).

PAG - Standards indexed with this acronym are based on the standards used by the Commonwealth of Pennsylvania that have been adopted for use by DNREC for various compounds for which there are no or incomplete RBC data. The Pennsylvania criteria have been modified to reflect the excess upper-bound lifetime carcinogenic risk of 1 in 1,000,000 or hazard index of 0.1.

PQL - Standards indexed with this acronym are actual RBC or calculated values (RBM, CALA, or CALB) for a given analyte -- however, the Department recognizes that these standards are possibly lower than the practical quantitation limits (PQL) available for those analytes (typically 0.1 ug/l or 0.5 mg/kg). Therefore, attainment of the PQL may be appropriate to demonstrate attainment with the standard. Typical PQL values associated with relevant established methods in the SOPCAP are included in Attachment 5. However, if a particular contaminant is known to be present, and the SOPCAP method does not provide a sufficient practical quantitation limit which approaches the URS listed for that contaminant, then other analytical methods may be required by the Department to meet the data quality objectives regarding quantitation limits.

RBC - Standards indexed with this acronym are obtained from the EPA Region III Risk-Based Concentration Table document, dated April 1999, without modification. The RBCs are the basis for most of the URS applicable for carcinogenic compounds, which are calculated for an excess upper-bound lifetime risk of 1 in 1,000,000. Although the carcinogenic compound risk value is one order of magnitude higher than the HSCA regulation upper-bound risk of 1 in 100,00, a more restrictive risk basis was chosen for surface soil to account for multiple site contaminants and other site uncertainties. This risk basis is consistent with the generic conservative approach of the URS.

RBM - Standards indexed with this acronym are a modification of the values presented for non-carcinogenic compounds in the EPA Region III Risk-Based Concentration Table document, dated April 1999. The non-carcinogenic compound RBCs have been uniformly adjusted to be equivalent to a hazard index of 0.1 to be consistent with the generic conservative approach of the URS. The adjustment is warranted to account for multiple site contaminant and uncertainty considerations, as the RBCs are calculated for a hazard index of 1, which is the maximum hazard index value promulgated in the HSCA regulations.

Given that HSCA regulations require that the risk from a site shall not be greater than 1 in 100,000 for carcinogens or a hazard index of 1 for non-carcinogens, the RBC and RBM derived values may be conservative at some sites, especially those with only one or two analytes present. **In these cases, calculating a site-specific standard using the modified URS-methodology presented in the SSS portion of this document may be more appropriate.**

SMCL - Standards indexed with this acronym are current EPA-promulgated secondary maximum contaminant levels (SMCLs). It should be noted that aesthetic water quality criteria are not health-based criteria, but are important water quality indicators that are often affected by the presence of other contaminants. To be consistent with the conservative nature of the URS, they are included for completeness. **If the SMCLs are not appropriate for a given site, the site-specific approach may be more suitable.**

SSLI - Standards indexed with this acronym are obtained from the 1996 EPA Soil Screening Guidance. They represent the generic soil screening levels (SSLs) provided in the guidance for

the inhalation of volatiles pathway. These values are used in cases where the SSL inhalation value for an analyte is less than the RBC value (which is based on the ingestion pathway).

4.2 PROTECTION OF THE ENVIRONMENT URS

The protection of the environment URS for surface water, sediment, and surface soil are included on Attachment 3. These environment URS are applicable to sites which are retained for further ecological evaluation after preliminary screening (see Attachment 2), or have been determined to pose a threat to the environment. It should be noted that there are a limited number of URS that are available for protection of the environment; therefore, the table does not provide data for many of the analytes listed. **Consequently, the site-specific standard approach will be required for sites which contain analytes for which there are no URS for environmental protection.**

The items in the URS legend pertaining to the protection of the environment, which identify the basis for the calculation of the URS values, is further expanded below.

Environment URS Table Legend Definitions:

DWQ - Standards indexed with this acronym are the State of Delaware Surface Water Quality Standards, as amended February 26, 1993. Many of these values are derived from equations which include a hardness and pH parameter. To ensure consistent application with the EPA Ecotox and Oak Ridge National Laboratory data bases, default values of 100 mg/l for hardness and a pH of 7.8 were used to derive the surface water values presented. **It should be noted that the Department encourages the development of site-specific URS using the Surface Water Quality Standard equations where sufficient site-specific data for hardness and pH have been collected during site investigation activities.**

ECTX - Standards indexed with this acronym are EPA Ecotox Threshold Benchmark values included in EPA 540/F-95/038, ECO Update - Ecotox Thresholds, January 1996 (Publication 9345.0-12FSI). These benchmark values are derived from a variety of sources or equations, including: EPA Ambient Water Quality Criteria; Great Lakes Water Quality Initiative Tier II methodology; EPA Sediment Quality Criteria; equilibrium partitioning methodology; and effects range values.

EPAR - Standards indexed with this acronym are EPA National Recommended Water Quality Criteria for Priority Toxic Pollutants included in the Federal Register (FRL-OW-6186-6a), Volume 63, No. 234, Monday December 7, 1998. These values are a compilation of recommended water quality criteria for 157 pollutants pursuant to section 304(a) of the Clean Water Act. These recommended criteria provide guidance to the States in adopting water quality standards under Section 303(c) of the Clean Water Act. These criteria are not regulations - Only guidelines.

NDA - This indicates that no data are currently presented for a given analyte in the State of Delaware Surface Water Quality Standards, EPA Ecotox Threshold Benchmarks or Oak Ridge National Laboratory data bases.

ORNL - Standards indexed with this acronym are obtained from the U.S. Department of Energy Oak Ridge National Laboratory Screening Benchmarks for Ecological Risk Assessment Data Base, Revision 1.0, dated May 1998. These values have been derived from a variety of sources or

equations, and in some cases are similar to the EPAEcotox sources or methodologies. To ensure consistent application with the EPAEcotox and State of Delaware standards, default values of 100 mg/l for hardness and a pH of 7.8 were used to derive surface water values, and a total organic carbon concentration of 10,000 mg/kg, or 1% was used to derive sediment standards.

5.0 SITE-SPECIFIC STANDARD

The site-specific standard (SSS) approach is appropriate in lieu of the Background or Uniform-Risk Based options. Specifically, this approach is appropriate for sites where BGS or URS cannot be attained; or sites which have conditions which are inconsistent with the assumptions used to derive the URS; or sites which contain substances in any media which are not listed in this document; or sites with multiple contaminated media beyond soil or ground water (i.e. sediment, surface water, air, biota, etc.). The degree of liability release for cleanup to a site-specific standard, or the use of risk management techniques, will be determined on a case-by-case basis, but could range from deed restrictions to no restrictions on the deed or use.

Under this approach, there are several site-specific methodologies that can be employed to derive site-specific standards. The methodologies are as follows:

Method 1 - Modified URS Approach
Method 2 - Pathway Analysis Approach
Method 3 - Quantitative Risk Assessment Approach

Each methodology requires a differing level of effort to complete, ranging from a minimal level-of-effort under the modified URS approach, to a maximum level-of-effort under the traditional quantitative risk assessment approach. A single methodology or combination of methodologies can be used at a given site. However, all SSS tasks must comply with the Delaware Regulations Governing Hazardous Substance Cleanup and the HSCA Guidance Manual. It is recommended that the Department be consulted regarding the most appropriate site-specific standard approach for a given site.

Consistent with HSCA regulations, any site-specific human health soil and ground-water remediation standards developed shall meet the following standards:

- For known or suspected human carcinogens, a standard representing an excess upper-bound lifetime risk of 1 in 100,000. The cumulative excess risk to exposed populations shall not be greater than 1 in 100,000.

- Systemic toxicants—For systemic toxicants, soil and ground-water cleanup standard which represent levels to which the human population could be exposed on a daily basis without appreciable risk of deleterious effect to the exposed population. Where several systemic toxicants affect the same target organ or act by the same method of toxicity, the hazard index shall not exceed one. The hazard index is the sum of the hazard quotients for multiple systemic toxicants acting through a single-medium exposure pathway or through multiple-media exposure pathways.

Regardless of the methodology selected, consideration should be given to: appropriate exposure factors to receptors based on land use of the site; the effectiveness of institutional or other controls placed on the future land use; potential pathways for human exposure; measures for

pathway elimination; and appropriate statistical techniques. These considerations are discussed further in the following methodology descriptions.

5.1 METHOD 1 - MODIFIED URS APPROACH

The modified URS approach provides a means to develop site-specific standards by modifying some of the basic assumptions used in the URS approach to reflect actual site conditions or data. The modified URS approach may include:

- *Site-Specific Standard Calculation Using Site-Specific Data* - The standards for surface and subsurface soil in critical water resource areas can be derived using site-specific data using the general equations described in the URS section of this document. Site specific data such as organic carbon content, porosity, and bulk density or a site-specific partition coefficient (Koc or Kd) derived from leaching tests can be used in the equation. The standards for surface water and sediment can also be derived using site-specific data.

- *Site-Specific Standard Calculation Using Updated Toxicological Constant* - Any standard derived from the RBC can be recalculated using the RBC equations (See Attachment 4) if an updated toxicological constant different from that used in the RBC becomes available. However, sufficient supporting documentation on the applicability of any updated toxicological constant would have to be submitted for Department review prior to the acceptance of a site-specific standard derived using this method.

- *Site-Specific Standard Calculation for a Single Analyte* - In cases where there is a single analyte found at concentrations exceeding the URS, but at concentrations generally less than an order of magnitude above the URS, the respective URS may be modified to reflect the 1 in 100,000 risk level (carcinogenic compounds - order of magnitude increase) or hazard index of 1(non-carcinogenic compounds - order of magnitude increase) level.

- *Site-Specific Standard Calculation for Multiple Analytes* - In cases where there are multiple analytes found at concentrations exceeding the URS, but at concentrations generally less than an order of magnitude above the URS, the RBC equations can be used to calculate the risk posed by the multiple contaminants. A risk or hazard index for each analyte would have to be calculated using the RBC equations, then added together to determine the cumulative risk. The respective concentrations would become the site-specific standard if the cumulative risk posed by all compounds and analytes does not exceed 1 in 100,000 risk (carcinogenic compounds) and a hazard index of 1 (non-carcinogenic compounds). **Note that the Department retains the discretion to require a site-specific risk assessment for any site with multiple analytes at concentrations in excess of the URS.**

5.2 METHOD 2 - PATHWAY ANALYSIS APPROACH

The pathway analysis approach provides a means to derive site-specific standards based on an evaluation of the potential for the completion of exposure pathways for a given site. If it can be fully determined and documented that no complete exposure pathways exist for a given site, then alternative standards (such as non-critical URS standards being applied to a area defined as critical) or existing site concentrations (under certain conditions) may be considered as site-specific standards. The pathway analysis approach may include:

- *Site-Specific Standard Determination Using Modified URS Definitions* -This methodology allows for the modification of the generic definitions used for the URS to better reflect actual conditions for a given site. The following scenarios are appropriate for this methodology:

  - Reclassification of a site designated as a critical water resource area to a non-critical water resource area in situations where it can be fully documented that water supply wells are located in deeper confined aquifers and are not impacted by nearby surface activities (i.e. recharge areas are not within 500 feet of the wellhead). Hence, the less stringent subsurface soil standards (and some surface soil standards) of the non-critical area would apply. Documentation should include published reference (such as DGS and USGS publications) and site-specific evidence of the presence of confining layer(s) at the site, water supply well construction information (especially screened interval depth), etc.

  - Reclassification of a site designated as a critical water resource area to a non-critical water resource area in situations where it can be fully documented that the site is within a designated ground-water management zone or other area defined by the Department as having no beneficial ground-water use. Hence, the less stringent subsurface soil standards (and some surface soil standards) of the non-critical area would apply.

  - The use of a combination of the unrestricted surface soil and restricted subsurface soil URS in a setting which would typically be considered unrestricted (such as a residential area). This could be used at sites where it can be fully documented that there is no complete pathway to the subsurface soil (see pathway elimination discussion) and the more stringent unrestricted subsurface soil URS would not apply. However, this combination would result in a restricted use designation for the site, including deed notice and restrictions or other risk management requirements where applicable.

- *Site-Specific Standard Determination Using Pathway Elimination* -This methodology allows, on a case-by-case basis, for existing site concentrations to be used as site-specific standards in situations where it can be determined and fully documented that there are no complete exposure pathways for a given media. However, incomplete pathway determination would not preclude the requirement to address sources such as free product, hazardous waste, hot spots, etc.

  A pathway is complete if the following criteria are met: (1) there is a source or chemical release from a source, (2) there is an exposure point where contact can occur (either currently or in the future), and (3) there is an exposure route by which contact can occur (either currently or in the future). Pathways are not considered complete if one or more of those criteria are not met. The approach for identifying and documenting exposure pathways is described in the Risk Assessment Guidance for Superfund, Volume 1 - Human Health Evaluation Manual (Part A), Section 6.3 “Identification of Exposure Pathways” (EPA/540/1-89/002), and USEPA Region III Technical Guidance Manual, Risk Assessment, Selecting Exposures Routes and Contaminants of Concern by Risk-Based Screening. EPA/903/R-93-001.

There are various remedial options available that can eliminate complete exposure pathways to facilitate the use of this site-specific standard approach. However, risk management practices to eliminate exposure pathways are only applicable after the risk posed by the site has been adequately identified and evaluated as part of the determination of cleanup action for a site.

5.3 METHOD 3 - QUANTITATIVE RISK ASSESSMENT APPROACH

This methodology employs the traditional EPA risk assessment approach to characterize the risk posed by a given site and derive site-specific cleanup standards. This methodology is most appropriate where the exposure scenarios are complex, multiple pathways exist, or various media are impacted (including air, sediment, ground-water, surface-water, fish, etc.). The most recent and relevant guidance on conducting human health risk assessments (including RAGS Part D) and developing site-specific remediation standards is presented in Attachment 4.

6.0 DEMONSTRATION OF ATTAINMENT REQUIREMENTS

Attainment of the selected remediation standard shall be demonstrated using appropriate sampling, analytical, and statistical methods. The attainment requirements presented in this section apply to the vertical and horizontal extent of soil/sediment identified as "contaminated" and to ground-water/surface-water at the point of compliance and beyond.

Demonstration of attainment with the remediation standards has two major components: the number of confirmation samples required and the statistical analysis of the data.

6.1 NUMBER OF CONFIRMATION SAMPLES REQUIRED

The minimum number of sample points required to demonstrate attainment for each media follow. It should be noted that the number of data points is not necessarily synonymous with the number of discrete sample locations, especially as it relates to ground water and surface water; however, a sampling approach which uses the maximum possible number of discrete locations is recommended.

- Ground-water -- A minimum of 8 quarters of ground-water data are required. Alternatively, 8 measurements collected over a minimum of 4 quarters may be considered sufficient if there is adequate spatial monitoring of the plume; parameters affecting fate and transport have been fully evaluated; and the age of the plume is sufficiently known to permit a judgment to be made regarding its stability. Ground-water data are required from appropriate point of compliance locations (such as a property boundary) and/or locations downgradient of the point of compliance.

- Soil/Sediment -- A minimum of 10 sample points are required for remedial actions addressing volumes less than 125 cubic yards of soil/sediment (an approximate area 15 feet x 15 feet x 15 feet deep), and a minimum of 12 sample points are required for actions addressing

soil/sediment volumes in excess of 125 cubic yards. Additional sample points may be required based on site-specific conditions.

All attainment sample locations shall be randomly selected (horizontal and vertical) throughout the remediation area.

- Surface Water -- A minimum of 10 sample points are required from appropriate point of compliance locations and/or locations downstream of the point of compliance. Additional sample points may be required based on site-specific conditions.

In addition to the minimum number of data points, a statistically-based approach for determining the appropriate number of samples necessary to demonstrate attainment for larger remediation sites (i.e. greater than 125 cubic yards or greater than 1 acre) is required. One of the following approaches can be used to determine minimum sample size to demonstrate attainment for larger remediation sites:

- The hot-spot determination method taken directly from the EPA guidance document Methods for Evaluating Attainment of Cleanup Standards: Soils and Solid Media, is included in Attachment 4. This method can be used to calculate a sample grid spacing and the number of samples necessary to detect an area of contamination of a pre-determined size at a pre-specified confidence limit. The contamination area size, acceptable probability of not finding the contaminated area for a given site, and the minimum number of samples beyond 12 required to demonstrate attainment shall be pre-approved by the Department on a site-specific basis. All sampling is proposed to berandom within the grid system.

- The hot spot evaluation approach in Attachment 4 is also available as part of a free computer program available from the American Chemical Society (ACS) Division of Environmental Chemistry. DQO-PRO, a Microsoft Windows based environmental calculator program, was developed as part of EPA's Data Quality Objective (DQO) process. The software can be obtained directly from the ACS homepage at : http://www.acs-envchem.duq.edu

- Some other pre-approved statistically-based method for determining sample size (see Attachment 4 for relevant references).

The Department recognizes that a smaller number of samples may be sufficient to demonstrate attainment under certain site-specific conditions. Consequently, the Department will consider a site-specific demonstration of attainment sampling approach consisting of fewer than the minimums stated previously on a case-by-case basis. However, any variance request will have to be supported by a reasonable site-specific data base and inferential statistical analysis or other documentation that can demonstrate that fewer attainment samples are appropriate.

6.2 STATISTICAL ANALYSIS - DEMONSTRATION OF ATTAINMENT

There are various statistical methods available to demonstrate attainment. The primary statistical reference documents for demonstrating attainment are a three volume series of EPA guidance manuals (see Attachment 4).

Different statistical analysis approaches are appropriate for each of the three remediation standards. The site-specific BGS approach requires a demonstration of attainment that compares the distribution between two sample populations (the sample population used to determine the site-specific BGS and the sample population from the remediated area). The default BGS and URS approaches require a comparison of the sample population from the remediated area to a specific value that is considered to be highly conservative. Finally, the SSS approach requires a comparison of the sample population from the remediated area to a site-specific value that is not likely to be as conservative as the default BGS or URS. Consequently, different approaches to the demonstration of attainment are required.

To demonstrate attainment, one of the following methods (see Table 1) or some other pre-approved statistical method for demonstrating attainment (see Attachment 4 for applicable references) shall be used:

All Approaches (BGS, URS, SSS)

- The highest measurement of a substance from the remediation area is not greater than the default or site-specific BGS, URS, or SSS (no exceedance rule);

Site-Specific Background Standard Approach

- A non-parametric statistical method that compares the means of two populations (such as the Wilcoxon Rank Sum (also known as the Mann Whitney) test, or Quantile test described in EPA 1992 Statistical Methods for Evaluating the Attainment of Cleanup Standards, Volume 3 - see Attachment 4 for complete reference)

Default Background Standard or Uniform Risk Standard Approach

- 75% of all samples collected for attainment purposes shall be equal to or less than the remediation standard with no individual sample exceeding ten times the standard on the property, or two times the standard beyond the property. (Note that this method is not applicable to the SSS approach. It has been determined that under certain situations of high data variability, this method could demonstrate attainment although the true arithmetic average concentration actually exceeds the remediation standard. However, this is not problematic for the default BGS and URS approaches, given the generally conservative assumptions used to derive the default BGS and URS.

Default Background, Uniform Risk and Site-Specific Standard Approach

- The 95% upper confidence level of the arithmetic mean of the samples collected for attainment purposes shall be at or below the remediation standard, provided the statistical analysis is applied in accordance with EPA approved methods on statistical analysis of environmental data. Any statistical method use to determine the 95% UCL of the arithmetic mean shall comply with the following:

  - For application of the default background, uniform-risk, or site-specific remediation standards, the null hypothesis (Ho) shall be that the remediation standard is not achieved, and the alternative hypothesis (Ha) shall be that the remediation standard is achieved. For application of site-specific background standards, the null hypothesis (Ho) shall be that the background standard is achieved, and the alternative hypothesis (Ha) shall be that the remediation standard is not achieved.

  - The underlying assumptions of the statistical method shall be met, such as data distribution (normal, lognormal, other).

  - Tests shall account for nondetects without assigning a zero value.

  - Testing shall be done individually for each substance being remediated at a site.

TABLE 1
DEMONSTRATION OF ATTAINMENT REQUIREMENTS SUMMARY

MEDIA OF CONCERN	MINIMUM NUMBER OF ATTAINMENT SAMPLES REQUIRED
GROUND WATER	8 quarters of data over 2 years; or 8 samples collected over 4 quarters (1 year)
SOIL/SEDIMENT (Small Sites)	10 sample points for sites with less than 125 cubic yards of remediation
SOIL/SEDIMENT (Large Sites)	Greater than 12 sample points for sites with greater than 125 cubic yards of remediation. Statistically-based approach required to determine the appropriate number of sampling points for larger sites.
SURFACE WATER	10 sample points

DEMONSTRATION OF ATTAINMENT STATISTICAL APPROACH OPTIONS	REMEDIATION STANDARD
• Highest measurement comparison (i.e., no attainment sample from the remediation area exceeds the appropriate standard) • Other statistical methods that meet performance criteria.	**BACKGROUND STANDARD - (default and site-specific)** **UNIFORM RISK STANDARD** **SITE-SPECIFIC STANDARD**
Statistical methods that compare two populations that meet performance criteria (Wilcoxon Rank Sum/Mann Whitney, Quantile Test).	**BACKGROUND STANDARD - (site specific only)**
75% of attainment samples are less than/or equal to standard, with no sample greater than 10x the standard on-site, or 2x the standard off-site; or	**BACKGROUND STANDARD - (default only)** **UNIFORM RISK STANDARD**
95% upper confidence level (UCL) of the arithmetic mean of the attainment samples does not exceed the URS/SSS;	**BACKGROUND STANDARD - (default only)** **UNIFORM RISK STANDARD** **SITE-SPECIFIC STANDARD**

ATTACHMENT 1
OTHER DNREC BRANCH CLEANUP PROGRAM SUMMARY

CLEANUP PROGRAM SUMMARY FOR RELEASES MANAGED BY VARIOUS DNREC BRANCHES

The following is a summary of the types of sites that are addressed under the various branches in DNREC which conduct cleanup activities. A flow chart which summarizes which program to initially contact for past and present releases to the ground or to water is shown in Flow Chart I.

SOLID WASTE MANAGEMENT BRANCH (SWMB)

The Solid Waste Management Branch manages remediation of sites which:

1) are or should be permitted Sanitary, Industrial or Dry Waste landfills, Transfer Stations, Resource Recovery or Infectious Waste Management facilities.

2) have received a Facility Evaluation (FE) by SIRB and the FE results revealed a reduced potential for environmental impact resulting in the site being transferred to the SWMB for closure under the Delaware Regulations Governing Solid Waste.

3) have received or should have obtained prior approval from the SWMB for a recycling or reuse activity or bioremediation of a nonhazardous solid waste.

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

The HWMB regulates the investigation and remediation of sites with potential or known releases to groundwater, surface water, sediment, soil and air if the release has occurred at a facility that has applied for, currently has, had in the past, or should have/ have had a RCRA permit to treat, store or dispose of hazardous waste.

UNDERGROUND STORAGE TANK BRANCH (UST)

UST regulates petroleum and hazardous substance releases from tank systems. An UST system is everything associated with the tank and piping. Notification of a release can be made directly to the UST Branch or to Environmental Response Branch (ERB) - ERB just passes it along to the UST Branch. The release must be reported within 24 hours to the Department (this means an underground release discovered via leak detection or other method). An aboveground spill or overfill of an UST system greater than 25 gallons must also be reported within 24 hours. Releases, spills, and overfills related to tanks of non-petroleum hazardous substances must be reported immediately to the UST Branch and the National Response Center.

SITE INVESTIGATION AND RESTORATION BRANCH (SIRB)

For a site to fall into SIRB, the following criteria apply:

- There must have been a release of hazardous substance at the site. Hazardous substance. has been defined in the statute and the regulations. This includes more than 600 chemicals listed in National Contingency Plan promulgated under Comprehensive Environmental Response and Liability Act. Hazardous substance also includes all hazardous wastes, listed and characteristic, and petroleum and petroleum products.

- If the release is from an UST managed by the UST program, it is not subject to action under HSCA

- A site subject to RCRA corrective action permit will not come under the purview of HSCA.

- Even though no statutory or regulatory reporting is required under HSCA, SIRB has established screening guidelines and draft remediation standards and encourages anyone discovering contaminants exceeding these criteria to report to SIRB to decide the future course of action.

ENVIRONMENTAL RESPONSE BRANCH (ERB)

The Environmental Response Program is responsible for the rapid response, assessment and management of a variety of environmental incidents to protect public health, safety and the environment. After normal working hours, the Environmental Response Team assists the ERB in providing these services on a twenty-four hour basis.

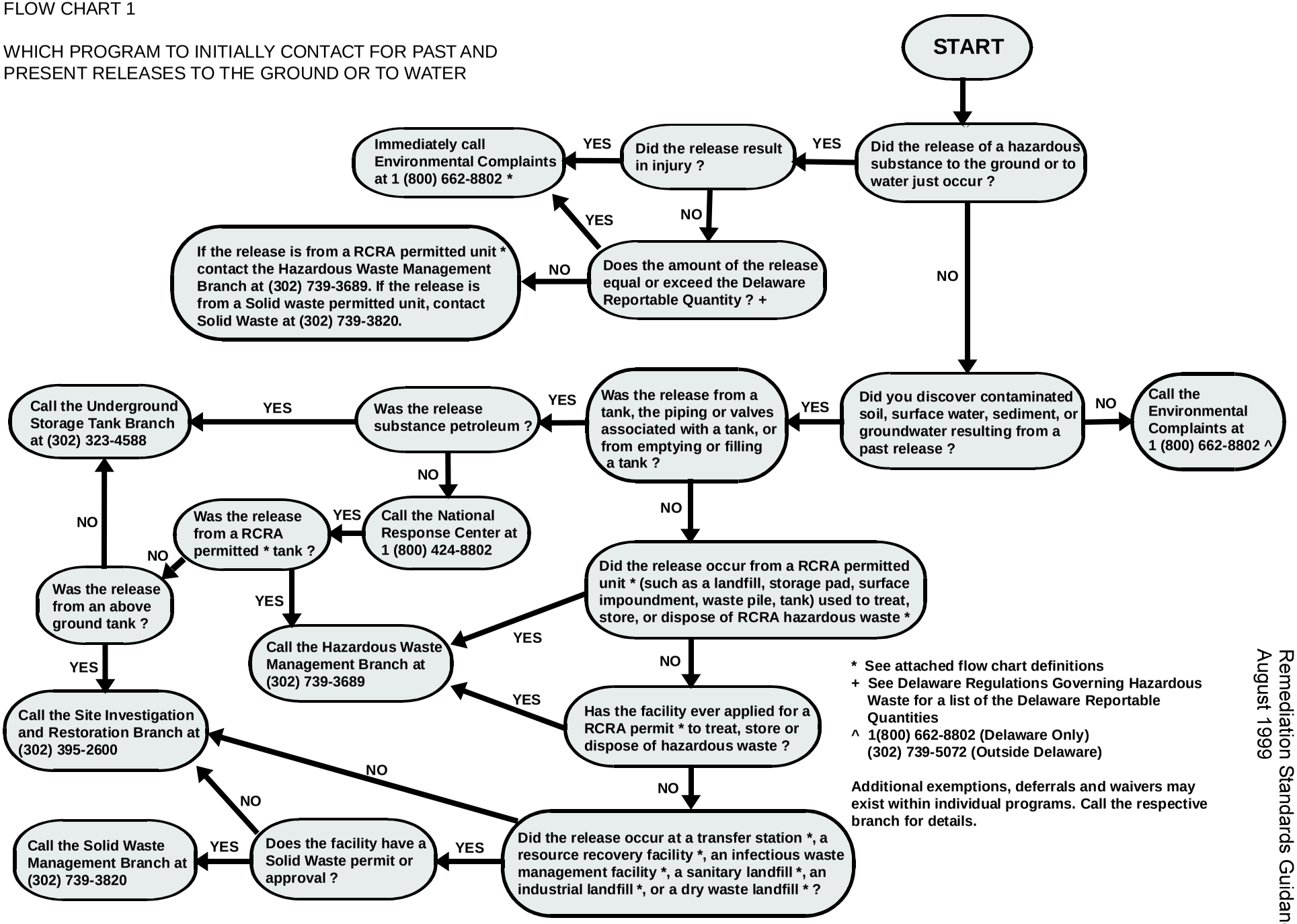
The Environmental Response Group should be immediately notified of the following:

1. All actual or potential releases of Delaware reportable quantities (DRQ's). This includes in part:
   - All petroleum releases to surface water or ground water.
   - All discharges of 25 gallons. or more of motor fuel, heating oil, used oil or used petroleum substances and discharges of 150 gallons or more of other petroleum substances.
   - All medical waste.
2. All abandoned containers.
3. All pollutant or air contaminant-related incidents or suspected health impacts.
4. All pollutant or air contaminant releases requiring a clean up.
5. All reports, inquiries or other communications related to pollution incidents from fire or police departments, municipalities, US Coast Guard, US EPA, other Federal agencies, other states and their jurisdictions, national or regional response teams, etc.
6. Other environmental problems as necessary.

IF IN DOUBT NOTIFY THE ENVIRONMENTAL RESPONSE GROUP AT 800-662-8802.

FLOW CHART 1

WHICH PROGRAM TO INITIALLY CONTACT FOR PAST AND PRESENT RELEASES TO THE GROUND OR TO WATER



* See attached flow chart definitions

\+ See Delaware Regulations Governing Hazardous Waste for a list of the Delaware Reportable Quantities

^ 1(800) 662-8802 (Delaware Only)
(302) 739-5072 (Outside Delaware)

Additional exemptions, deferrals and waivers may exist within individual programs. Call the respective branch for details.

DEFINITIONS FOR FLOW CHART I

DRY WASTE (formerly called INERT SOLID WASTE) means wastes including, but not limited to, plastics, rubber, lumber, trees, stumps, vegetative matter, asphalt pavement, asphaltic products incidental to construction/demolition debris, or other materials which have reduced potential for environmental degradation and leachate production.

INDUSTRIAL LANDFILL means a land site at which industrial waste is deposited on or into the land as fill for the purpose of permanent disposal, except that it will not include any facility that has been approved for the disposal of hazardous waste under the Delaware Regulations Governing Hazardous Waste.

INDUSTRIAL WASTE means any water-borne liquid, gaseous, solid or other waste substance or a combination thereof resulting from any process of industry, manufacturing, trade or business, or from the development of any agricultural or natural resource.

RCRA HAZARDOUS WASTES are wastes defined as hazardous in the Delaware Regulations Governing Hazardous Waste. Call the Hazardous Waste Management Branch at (302) 739-3689 to find out if a waste is hazardous.

RCRA PERMITS are issued to facilities that treat, store or dispose of hazardous waste. The Delaware Regulations Governing Hazardous Waste defines what hazardous wastes are. Some storage and treatment of hazardous waste may be allowed without a permit, provided certain conditions are met. Call the Hazardous Waste Management Branch at (302) 739-3689 to find out if a permit is needed and if a waste is hazardous.

RESOURCE RECOVERY means the process by which materials, excluding those under the control of the Nuclear Regulatory Commission, which still have useful physical or chemical properties after serving a specific purpose are reused or recycled for the same or another purpose, including use as an energy source.

SANITARY LANDFILL means a land site at which solid waste is deposited on or into the land as fill for the purpose of permanent disposal, except that it will not include any facility that has been approved for the disposal of hazardous waste under the Delaware Regulations Governing Hazardous Waste.

TRANSFER STATION means any facility where quantities of sold waste delivered by vehicle are consolidated or aggregated for subsequent transfer by vehicle for processing, recycling, or disposal.

Screening Criteria for Each Program	
Hazardous Waste Management Branch (HWMB)	The Hazardous Waste Management Branch (HWMB) uses screening levels to help determine whether or not additional investigation and characterization of a site is needed after contamination is discovered. For RCRA Corrective Action sites, the Branch typically uses the EPA Region III Risk-Based Concentrations (RBCs) as screening levels. Because the HWMB is not yet authorized for RCRA Corrective Action, U.S. EPA concurrence of screening levels is needed. The U.S. EPA makes the final decision on whether or not additional investigation and characterization of a RCRA corrective action site is required. For hazardous waste regulated units undergoing RCRA closure, which is a State lead activity, the HWMB has used background levels, proposed CFR 40 Part 264 Subpart S standards, and RBC's as soil screening levels. For evaluating groundwater data, the HWMB has used Safe Drinking Water Act maximum contaminant levels, regulatory limits provided in the DRGHW Part 264.94, background levels, and levels specified in a facility's RCRA permit.
Underground Storage Tank Branch (USTB)	The Underground Storage Tank Branch (USTB) recently adopted Delaware's Risk Based Corrective Action Program (DERBCAP) for UST Sites. DERBCAP uses tiered action levels: A) Tier 0 are typically screening levels; B) Tier 1 Risked Based Screening Levels (RBSLs) are used if Tier 0 levels are exceeded; C) Tier 2 – Site Specific Target Levels (SSTLs) and D) Tier 3 – more detailed SSTLs, based on numerical modeling and site-specific risk assessment. The DERBCAP approach is consistent with the historical approach used by the UST branch for remediating LUST sites in Delaware. The DERBCAP approach is intended to make the assessment of risk more quantitative. A new tank removal must enter DERBCAP at the Tier 0 level. DERBCAP does not address imminent human safety and emergency responses, air migration pathways, or ecological impacts
Site Investigation and Restoration Branch (SIRB)	SIRB formerly used screening levels for 107 commonly found chemicals by modifying the screening levels that EPA published last year. The Uniform Risk Standards now replace the screening levels.
Solid Waste Management Branch (SWMB)	No applicable screening levels
Emergency Response Branch (ERB)	No applicable screening levels

ATTACHMENT 2

INVESTIGATION GUIDANCE

HOT SPOT SAMPLING APPROACH
ECOLOGICAL SCREENING APPROACH

INVESTIGATION GUIDANCE

This attachment includes general guidance for the investigation and assessment of sites, which is critical to obtain the necessary data to determine if remediation is necessary at a given site. The primary investigative guidance is the HSCA Guidance Manual (October 1994), which should be consulted for how to proceed with typical site investigations. **This attachment will be updated periodically with new guidance on a variety of investigation approaches to ensure the most cost-effective, but thorough, site characterization activities.**

Included in the standards document are guidance for background determination and demonstration of attainment, the basic principals of which can also be applied to site investigation activities. To further supplement the background and attainment guidance, the following are included in this attachment:

- Hot Spot Sampling Approach
- Ecological Screening Approach

The hot spot sampling approach, although initially included in the remediation standards document to support demonstration of attainment activities, is well suited for initial site characterization activities as well. One of the biggest challenges of site characterization is to determine how many samples are sufficient to characterize a site. The hot spot sampling approach provides a statistically-based method for determining how many samples may be necessary to adequately characterize a given site. It is recommended that a statistically-based sampling approach, which includes the collection of a minimum number of samples (such as the minimum number of samples discussed in Section 3.2 (Background Sampling) or Section 6 (Demonstration of Attainment) of the standards document), always be used to ensure that only necessary data of adequate quality and quantity are collected and properly evaluated to support decisions regarding the site.

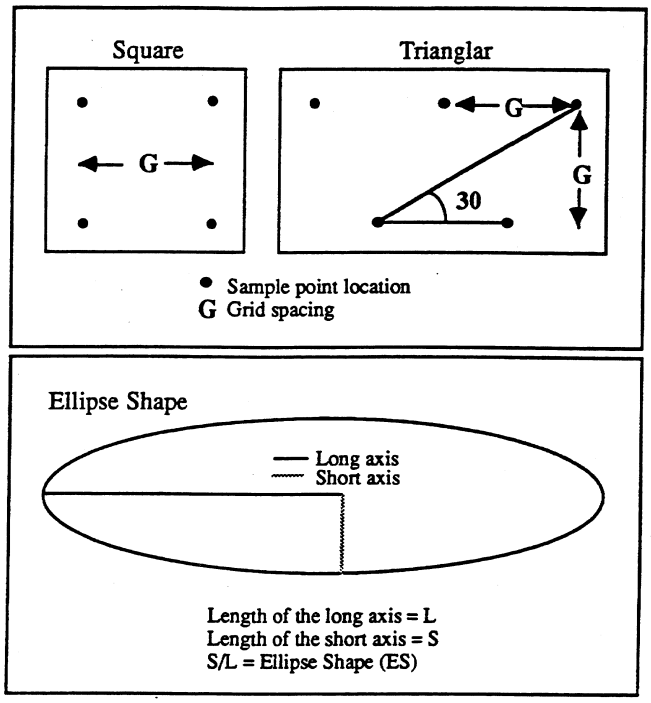
The ecological screening approach presented in this attachment should be incorporated into the initial planning stages of any site investigation to identify the potential for ecological concerns. Should the potential for concern be identified, then the appropriate ecological data can be collected during initial field activities to characterize and evaluate the ecological concern. Ecological evaluation is often overlooked or not conducted until after a site has already undergone extensive characterization. The ecological screening approach is one step in the site assessment process, and is an important decision point where data are applied.

HOT SPOT SAMPLING APPROACH

The following is taken directly from Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media (EPA 230/02-89-042, February 1989), Chapter 9, Searching for Hot Spots.

CHOICE OF SAMPLING PLAN

The approach to hot spot identification has three major components **grid pattern** (spacing between points, geometry of the sample point locations), **hot spot shape** (the length of the long axis of the hot spot) and **false positive rate** (an acceptable false positive probability; concluding that no hot spots are present where there is at least one present) control the performance of a hot spot detection sampling. The sampling plan for hot spot detection can be approached in three ways: the use of a fixed hot spot size; the use of a fixed sample size; and the use of a fixed sample size/false positive rate. Using any of these approaches, two of these factors are chosen and fixed. The third factor is determined by the choice of the first two factors.



The following table provides the information that allows choice of two factors while providing the resulting third parameter. Examples for each approach follow.

Triangular Grid Pattern
Ellipse Shape (ES= short axis/long axis)

L/G (Ellipse Long Axis Length/ Grid Spacing)	1.0	0.8	0.6	0.4	0.2	0.1	
0.1	**.95**	**.96**	**.97**	**.98**	**.98**	**.99**	**False-Positive**
0.3	**.66**	**.74**	**.80**	**.86**	**.93**	**.96**	**Rates**
0.5	**.08**	**.27**	**.44**	**.63**	**.82**	**.91**	
0.7	**.00**	**.00**	**.08**	**.33**	**.65**	**.83**	
0.9	**.00**	**.00**	**.00**	**.10**	**.47**	**.72**	
1.0	**.00**	**.00**	**.00**	**.04**	**.37**	**.66**	

Square Grid Pattern
Ellipse Shape (ES= short axis/long axis)

L/G (Ellipse Long/Axis Length Grid Spacing)	1.0	0.8	0.6	0.4	0.2	0.1	
0.1	**.97**	**.97**	**.98**	**.98**	**.98**	**.99**	**False-Positive**
0.3	**.72**	**.77**	**.80**	**.88**	**.94**	**.97**	**Rates**
0.5	**.21**	**.38**	**.54**	**.69**	**.85**	**.92**	
0.7	**.00**	**.02**	**.16**	**.42**	**.70**	**.85**	
0.9	**.00**	**.00**	**.00**	**.17**	**.53**	**.76**	
1.0	**.00**	**.00**	**.00**	**.08**	**.44**	**.70**	

Approach #1 - Fixed Hot Spot Size Example

Approach #1 is used when the size of the hot spot and false positive rate are known or assumed, and the grid spacing/sample size is determined.

The shape and size of the hot spots that are being searched for are elliptical with a long axis of L= 5 m and a short axis of S= 2 m. Therefore, the elliptical shape, ES = S/L = 2/5 = 0.4. In addition, the sampling team decided that they could accept no more than a 10 percent chance of missing a hot spot if a hot spot was present (a false positive rate of .10). A triangular grid pattern was chosen because the probability of detection was better with an elliptical shaped hot spot and the sampling team had experience laying out a triangular coordinate system. Using the triangular grid portion of the table, an ES value of 0.4 and a false positive value of .10 corresponds to an L/G value of 0.9. Solving for G, the grid spacing is G= L/0.9 = 5 m/0.9 = 5.6 m. The grid spacing must be evaluated with respect to the size of the sample area.

Once the grid spacing density has been determined, it is important to estimate for the sample area how many samples would be required given sampling intervals of 5.6 m on a triangular grid. The following method can be used to approximate the sample size necessary when area and grid interval are known:

$$n = A/G^2$$

where: n = total number of samples required
A = size of the area to be sampled (in the same units of measure as G)
G = grid spacing as defined

For example, suppose that a lagoon will be sampled that is 45 m by 73 m. This is a 3285 m^2 lagoon. The number of samples required is:

$$3285\ m^2 / (5.6\ m)^2 = 104 \text{ samples}$$

Alternatively, a lagoon that is 17 m by 20 m, or 340 m^2 , would require the following number of samples:

$$340\ m^2 / (5.6\ m)^2 = 11 \text{ samples}$$

If the size of the area is relatively small, then the level of confidence described above may be affordable and acceptable. However, if the area is large and the number of samples required is excessive, alternatives are available (approaches 2 and 3)

Approach #2 - Fixed Sample Size Example

Approach #2 is used when the sample size/grid spacing and ellipse shape are fixed, and the false positive rate is determined.

Suppose that no more than 40 samples can be collected at the 3285 m^2 lagoon because of cost, time, or logistics. The minimum grid spacing is estimated to be:

$$3285\ m^2 / (G)^2 = < \text{ or equal to } 40 \text{ samples}$$
$$(G)^2 = 3285\ m^2 / 40 \text{ samples} = > \text{ or equal to } 9.1\ m$$

The question becomes: what probability statement can be made with a 9.1 m grid spacing searching from a hot spot with a long axis of 5 and a short axis of 2. Using the triangular grid portion of the table, if L/G = 5/9.1 = .55, and ES = S/L = 0.4, then the false positive rate falls between .33 and .63. This means that there is a reduction in sample number from 104 to 40 (elimination of 64 samples) when the grid size is increased from 5.6 m to 9.1 m, but the probability of missing the hot spot increases from 10% to between 33 and 63%. If this probability is unacceptably high, then a third approach can be implemented.

Approach #3 - Fixed Sample Size/Fixed False Positive Rate

Approach #3 is used when the false positive rate and sample size or grid spacing are fixed, and hot spot size (larger or different shape) is determined.

Suppose it could be safely assumed that the hot spot of concern was not as elliptically shaped or as skinny as the ellipse with an ES = 0.4 (for example, the ES = 4/5 = 0.8). For the grid spacing of 5.6 m, the L/G = 5/5.6 = 0.9. Using the triangular grid portion of the table, it is clear that the false positive rate for this example is very low (table provides a value of .00, or less than 1% false positive rate). A willingness to search for a larger sized or fatter shaped hot spot improves the performance of the hot spot search technique from a 10 percent false positive rate to less than 1 percent false positive rate with no increase in the sample intensity above 104 samples.

ECOLOGICAL SCREENING APPROACH

Each site should be screened for potential ecological concerns as part of any site investigation to determine if further ecological evaluation is warranted. This screening process should be done as early in the investigation process as possible to ensure that the appropriate data are collected to evaluate ecological concerns.

The following screening method has been developed to provide interested parties with a quick method for evaluating whether their site warrants further ecological evaluation. Should the answers to all of the questions be "NO" and sufficient documentation (such as maps, agency correspondences, etc.) are available to support the negative declaration, then no further ecological evaluation would likely be necessary. However, should the answer to one or more of the questions be "YES," then further ecological evaluation of the site is warranted. The Environmental URS could also be applicable for sites which are retained for further evaluation. Further evaluation could range from completing a more rigorous screening method (see EPA screening guidance discussed later in this section) to rapid bioassessment evaluation to full-scale ecological risk assessment (see Attachment 4 for ecological risk assessment references).

INITIAL ECOLOGICAL EVALUATION SCREENING QUESTIONS

1. Are any of the following ecologically sensitive areas (ECSA) present on-site or immediately adjacent to the site (i.e. share a property boundary)? If the answer is "YES," then additional ecological evaluation is necessary.

   A. Critical Habitat, including breeding areas, migratory areas, and wintering areas for State or Federal designated endangered or threatened species, or habitat known to be used by designated, proposed, or under review endangered or threatened species **(REFERENCE: SEE ADDRESS BELOW).**
   B. Federal or State Park, Preserve, Forest, Wildlife Refuge or other Federal or State administered natural or recreational area, as well as other recognized parklands, open space, or other mapped natural areas managed by local government, non-profit organizations, or others **(REFERENCE: ROAD ATLAS/OTHER COMMERCIALLY AVAILABLE AREA MAPS).**
   C. Coastal Barrier, both developed and undeveloped, including private and public beaches **(REFERENCE: USGS TOPOGRAPHIC MAPS; ROAD ATLAS/OTHER COMMERCIALLY AVAILABLE AREA MAPS)**.
   D. Spawning, migration, and feeding areas critical for the maintenance of anadromous fish/shellfish species within river, lake, or coastal tidal waters **(REFERENCE: SEE ADDRESS BELOW).**
   E. Any waterway (stream, river, lake, tidal waters), including associated wetlands, floodplains, and riparian zones **(REFERENCE: USGS TOPOGRAPHIC MAPS; FEMA FLOODPLAIN MAPS; NATIONAL WETLAND INVENTORY MAPS; DELAWARE WETLAND MAPS; SITE OBSERVATIONS)**
   F. Recognized critical habitats for State listed species having the Delaware Natural Heritage Program Ranking of S1, S2, S3, S4, SU, SH, SX, and SE. **(REFERENCE: SEE ADDRESS BELOW)**
   G. Woodlands/forest in excess of 20 acres in size **(REFERENCE: AERIAL PHOTOGRAPHS, SITE OBSERVATIONS, USGS TOPOGRAPHIC MAPS)**

   To obtain information regarding items A (critical habitats), D (critical fish habitat), and F (Delaware Natural Heritage Program sites), send a correspondence to the following address:

   Delaware Department of Natural Resources and Environmental Control
   Division of Fish and Wildlife
   Delaware Natural Heritage Program
   4876 Hay Point Landing Road
   Smyrna, DE 19977
   (302) 653-2880

   Request a determination of whether any critical habitats under the jurisdiction of the DNREC Fish and Wildlife are present at the site. Be sure to include a copy of the applicable portion of a USGS topographic map (7.5 minute series) identifying the site boundaries.

   To obtain additional detailed information about item D (critical fish habitat - important for sites that encompass or share a property line with a major waterway), send a correspondence to the following address:

   National Marine Fisheries Service
   Habitat Conservation Division
   904 South Morris Street
   Oxford, MD 21654
   (410) 226-5771

2. Is the site within 2,000 feet of an ECSA? If the answer is "YES," proceed with the following questions. If the answer to any of these questions is also "YES," then additional ecological evaluation is necessary.

   A. Is the site connected to the ECSA via open-space, wooded area, agricultural land, perennial water body, or other natural corridor? If the answer is "YES," then additional ecological evaluation is necessary.
   B. Does storm runoff from the site discharge via pipe or drainageswale directly to the ECSA? If the answer is "YES," then additional ecological evaluation is necessary.
   C. Is there evidence of soil erosion from the site? Note that evidence of this would include gulleys, washout features, etc. If the answer is "YES," then additional ecological evaluation is necessary.

3. Does the site support a sufficient area (e.g. greater than 1/4 acre) of vegetation (exclusive of the typically maintained lawn and flowerbed landscaping) which could offer fauna either shelter or a food source? Note that evidence of this would include bird and wildlife sightings, burrows, nests, animal droppings, etc. If the answer is "YES," then additional ecological evaluation is necessary.

4. Is there any evidence of stressed vegetation, barren soil, dead animals, fish kills, or other ecological detriments at the site? If the answer is "YES," then additional ecological evaluation is necessary.

If the answer to all of the preceding questions is "NO," then no further ecological evaluation is generally required, and that negative determination should be documented in the final report for the site. However, the Department reserves the right to require additional ecological evaluation for any site, regardless of the outcome of the screening, to protect the environment. If the answer to any of the preceding questions is "YES," it is recommended that the Department be consulted to determine the scope and extent, if any, of further ecological evaluation.

The first approach to consider for sites warranting additional evaluation is the use of a more rigorous screening method. The most recent US EPA guidelines for a more rigorous screening approach is provided in the following reference:

- Interim Final Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, EPA-540-R-97-006, PB97-963211.

The general outline of this document is presented on the following pages. The new EPA guidance is still fundamentally based on the EPA's *Framework for Ecological Risk Assessment (USEPA, 1992)*, which provides the a basic structure and approach for conducting an ERA. The approach is generally executed by performing three steps: 1) problem formulation, which is the process to determine the focus and scope of the assessment; 2) data analysis, which is the hazard identification and stressor-response assessment; and, 3) the risk characterization, which is the determination of the level of ecological risk. A new component of the guidance is an risk screening process which determines initially whether an ecological risk assessment is warranted for a given site. This new component was developed to reduce unnecessary efforts, time delays, and costs associated with conducting an ERA when site conditions do not warrant such an effort.

OUTLINE OF THE 1997 USEPA ECOLOGICAL RISK GUIDANCE DOCUMENT

STEP 1	**Screening-Level Problem Formulation and Ecological Effects Evaluation**
	Screening-Level Problem Formulation Identify Environmental Setting and Contaminants at the Site Determine Contaminant Fate and Transport Identify Ecotoxicity and Potential Receptors Identify Complete Exposure Pathways Perform Assessment and Measurement Endpoints Screening-Level Ecological Effects Evaluation Identify Preferred Toxicity Data Determine Dose Conversions Perform Uncertainty Analysis
STEP 2	**Screening-Level Exposure Estimate and Risk Calculation**
	Screening-Level Exposure Estimates Define Exposure Parameters Perform Uncertainty Analysis Screening-Level Risk Calculation Scientific/Management Decision Point (SMDP)
STEP 3	**Baseline Risk Assessment Problem Formulation**
	Define the Problem Formulation Process Refinement of the Preliminary Contaminants of Concern Literature Searches on Known Ecological Effects Identify Contaminant Fate and Transport, Ecosystems Potentially at Risk, and Complete Exposure Pathways Select Assessment Endpoints Develop the Conceptual Model and Testable Hypotheses Develop the Conceptual Model Identify Risk Questions Scientific/Management Decision Point (SMDP)
STEP 4	**Study Design and Data Quality Objective Process**
	Establish Measurement Endpoints Evaluate Species/Community/Habitat Considerations Determine Relationship of the Measurement Endpoints to the Contaminants of Concern Identify Mechanism(s) of Toxicity Study Design Development Identify Appropriate Bioaccumulation and Field Tissue Residue Studies Identify Appropriate Population/Community Evaluations Identify Appropriate Toxicity Testing Data Quality Objectives and Statistical Considerations Identify Data Quality Objectives Evaluate Statistical Considerations Contents of Work Plan and Sampling and Analysis Plan Work Plan Sampling and Analysis Plan Field Verification of Sampling Plan and Contingency Plans Scientific/Management Decision Point (SMDP)
STEP 5	**Field Verification of Sampling Design**
	Identify Purpose(s) Determine Sampling Feasibility Scientific/Management Decision Point (SMDP)

STEP 6	**Site Investigation**
	Site Investigation Address Changing Field Conditions Develop Contingencies for Unexpected Nature or Extent of Contamination Analysis of Ecological Exposures and Effects Characterize Exposures Characterize Ecological Effects Scientific/Management Decision Point (SMDP)
STEP 7	**Risk Characterization**
	Perform Risk Estimation Develop Risk Description Determine Thresholds for Effects on Assessment Endpoints Obtain Additional Risk Information Perform Uncertainty Analysis Identify and Evaluate Categories of Uncertainty Track Uncertainties
STEP 8	**Risk Management**
	Ecological Risk Management Evaluate Other Risk Management Considerations Evaluate Ecological Impacts of Remedial Options Determine Monitoring Needs and Requirements Scientific/Management Decision Point (SMDP)

ATTACHMENT 3

REMEDIATION STANDARDS

DEFAULT BACKGROUND REMEDIATION STANDARDS
UNIFORM RISK-BASED REMEDIATION STANDARDS

DELAWARE DEFAULT BACKGROUND REMEDIATION STANDARDS
DECEMBER 1999

Default Background Standard*						
Contaminant	CAS	Ground Water (a) µg/L	Soil (b) mg/kg	Surface Water (c) µg/L	Sediment (d) mg/kg	Typical Delaware Soil Concentrations (h) mg/kg
Aluminum	7429905	200	7800 (e)	200	7800	4,800 - 12,000
Antimony	7440360	6	<0.5	6	<0.5	<0.5
Arsenic	7440382	1	0.4 (e)	1	0.4	1-10
Barium	7440393	4(f)	82	4(f)	20	40-80
Beryllium	7440417	0.7	10 (e)	0.7	0.5	0.6 - 1.0
Cadmium	7440439	1(f)	3	1(f)	1(g)	1-3
Chromium (III)	16065831	100	0.4	100	81	5-30
Cobalt	7440484	23	20	23	20	4-13
Copper	7440484	12(f)	50	12(f)	34(g)	15-40
Iron	7439896	300	2300 (e)	300	2300	3,000-22,000
Lead	7439921	15	41	15	47(g)	30 - 100
Manganese	7439965	50	180 (e)	50	180	60 - 350
Mercury	7439976	0.4	0.0005	0.4	0.2(g)	0.1 - 0.3
Nickel	7440020	100	30	100	21	5-15
Selenium	7782492	20(f)	0.2	20(f)	0.2	0.1 - 0.5
Silver	7440224	0.4(f)	2	0.4(f)	1	1-2
Thallium	7440280	2	1	2	1	1
Tin	7440315	73 (f)	12	73 (f)	12	3 - 12
Vanadium	7440622	19(f)	2 (e)	19(f)	2	15-40
Zinc	7440666	110(f)	8 (e)	110(f)	150	60 - 90

Organic Compounds (all)	Lowest Available Practical Quantitiation Limit (PQL)

*** - USERS ARE ENCOURAGED TO DEVELOP SITE-SPECIFIC BACKGROUND STANDARDS TO ADDRESS SITE-SPECIFIC CONSIDERATIONS WHERE THE DEFAULT STANDARD MAY NOT BE APPLICABLE OR APPROPRIATE**

*** - NOTE THAT ALL OF THE DEFAULT VALUES ARE EXPECTED TO BE UPDATED IN THE FUTURE TO BE MORE STATISTICALLY REPRESENTATIVE OF DELAWARE CONDITIONS**

(a) Ground-water values are a combination of ground-water URS and surface-water URS, whichever are more stringent.
(b) Soil values are upper value of the concentration range detected in background samples collected statewide. Note that these soil values are expected to be updated to be more statistically representative of Delaware conditions in the future.
(c) Surface water values are a combination of ground-water URS and surface-water URS, whichever are more stringent (dissolved data).
(d) Sediment values are a combination of the default background soil criteria and sediment URS, whichever are more stringent.
(e) Value presented is the most stringent soil URS value because the upper value of the concentration range (as described in item (b)) exceeds the unrestricted soil URS or the environment URS.
(f) Value presented is the surface water URS
(g) Value presented is the sediment URS
(h) The range of soil background values from representative sites in Delaware are provided for information only and are not default background standards. This information can be used to evaluate if the development of site-specific background standards is appropriate or useful.

- All soil and sediment values are dry weight basis
- All ground-water values are either total (water supply source) or dissolved (monitoring well) concentrations, depending on the application.

LEGEND

C = Carcinogenic/ N= Non-Carcinogenic
CALA - Ground-Water Standard x 100
CALB - Derived from Soil to Ground-Water Equation
EPA - EPA recommendation/guidance
HAL - EPA Health Advisory Level
MAG - Massachusetts Guidance for TPH (no RBC data)
MAX - Maximum Ceiling Value is 1000 mg/kg for unrestricted use and 5000 mg/kg for restricted use - actual RBC, RBM values are higher than ceiling.
MCL - EPA Maximum Contaminant Level
PAG - Pennsylvania Guidance (no RBC data)
PQL - Practical Quantitation Level - value presented is RBC, RBM, or calculated value (CALA, or CALB) which may be at, or below, the most applicable PQL. PQL may be used for demonstrating attainment . See Attachment 5 for applicable PQLs. PQL designation applied to URS <0.1 ug/l or <0.5 mk/kg.
RBC - EPA Risk-Based Concentration Table Value, April 1999 RBC values equal to risk of 10E-6
RBM - Modified RBC Value equal to a Hazard Index of 0.1
SMCL - EPA Secondary Maximum Contaminant Level
SSLI - EPA SSL Guidance Inhalation Value
(a) Some analytes have two ground water URS values presented (e.g., 2 /1); the lowest value is to be used for screening purposes.

All surface and subsurface soil values are dry weight basis/ground water values are total or dissolved concentration, depending on application

				URS for Protection of Human-Health													
					Critical Water Resource Area				Non-Critical Water Resource Area								
					Unrestricted Use				Restricted Use				Unrestricted Use			Restricted Use	
Contaminant		CAS	VOC	Ground Water (a) µg/L	Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg	Surface Soil mg/kg	Subsurface Soil mg/kg
Acetaldehyde	C	75070	☒	2 RBC	0.2 PQL		0.2 PQL		0.2 PQL		0.2 PQL		140 RBC		140 RBC	520 RBC	520 RBC
Acetochlor	N	34256821		73 RBM	7 CALA		7 CALA		7 CALA		7 CALA		160 RBM		160 RBM	4100 RBM	4100 RBM
Acetone	N	67641	☒	61 RBM	6 CALA		6 CALA		6 CALA		6 CALA		780 RBM		780 RBM	5000 MAX	5000 MAX
Acetonitrile	N	75078	☒	12 RBM	1 CALA		1 CALA		1 CALA		1 CALA		47 RBM		47 RBM	1200 RBM	1200 RBM
Acetophenone	N	98862	☒	0.004 PQL	4.E-04 PQL		4.E-04 PQL		4.E-04 PQL		4.E-04 PQL		780 RBM		780 RBM	5000 MAX	5000 MAX
Acrolein	N	107028	☒	0.004 PQL	4.E-04 PQL		4.E-04 PQL		4.E-04 PQL		4.E-04 PQL		160 RBM		160 RBM	4100 RBM	4100 RBM
Acrylamide	C	79061		0.2 RBC	0.02 PQL		0.02 PQL		0.02 PQL		0.02 PQL		0.1 PQL		0.1 PQL	1 RBC	1 RBC
Acrylonitrile	C	107131	☒	0.04 PQL	0.004 PQL		0.004 PQL		0.004 PQL		0.004 PQL		1 RBC		1 RBC	11 RBC	11 RBC
Alachlor	C	15972608		2 /0.8 MCL	0.2 PQL		0.2 PQL		0.2 PQL		0.2 PQL		8 RBC		8 RBC	72 RBC	72 RBC
Alar	N	1596845		550 RBM	55 CALA		55 CALA		55 CALA		55 CALA		1000 MAX		1000 MAX	5000 MAX	5000 MAX
Aldicarb	N	116063		7 MCL	0.7 CALA		0.7 CALA		0.7 CALA		0.7 CALA		8 RBM		8 RBM	200 RBM	200 RBM
Aldicarb sulfone	N	1646884		4 RBM	0.4 PQL		0.4 PQL		0.4 PQL		0.4 PQL		8 RBM		8 RBM	200 RBM	200 RBM
Aldrin	C	309002		0.004 PQL	4.E-04 PQL		4.E-04 PQL		4.E-04 PQL		4.E-04 PQL		0.04 PQL		0.04 PQL	0.3 PQL	0.3 PQL
Aluminum	N	7429905		200 SMCL	7800 RBM		7800 RBM		200000 RBM		200000 RBM		7800 RBM		7800 RBM	200000 RBM	200000 RBM
Aminodinitrotoluenes	N			0.02 PQL	0.002 PQL		0.002 PQL		0.002 PQL		0.002 PQL		0.05 PQL		0.05 PQL	0.1 PQL	0.1 PQL
4-Aminopyridine	N	504245		0.07 PQL	0.007 PQL		0.007 PQL		0.007 PQL		0.007 PQL		0.2 PQL		0.2 PQL	4 RBM	4 RBM
Aniline	C	62533		12 RBC	1 CALA		1 CALA		1 CALA		1 CALA		110 RBC		110 RBC	1000 RBC	1000 RBC
Antimony and compounds	N	7440360		6 MCL	3 RBM		3 RBM		27 CALB		27 CALB		3 RBM		3 RBM	82 RBM	82 RBM
Antimony pentoxide	N	1314609		2 RBM	0.2 PQL		0.2 PQL		0.2 PQL		0.2 PQL		4 RBM		4 RBM	100 RBM	100 RBM
Antimony tetroxide	N	1332316		2 RBM	0.2 PQL		0.2 PQL		0.2 PQL		0.2 PQL		3 RBM		3 RBM	82 RBM	82 RBM
Antimony trioxide	N	1309644		2 RBM	0.2 PQL		0.2 PQL		0.2 PQL		0.2 PQL		3 RBM		3 RBM	82 RBM	82 RBM
Arsenic	C	7440382		50 /0.50 MCL	0.4 PQL		0.4 PQL		3 CALB		3 CALB		0.4 PQL		0.4 PQL	4 RBC	4 RBC
Assure	N	76578148		33 RBM	3 CALA		3 CALA		3 CALA		3 CALA		70 RBM		70 RBM	1800 RBM	1800 RBM
Atrazine	C	1912249		3 /0.3 MCL	0.3 PQL		0.3 PQL		0.3 PQL		0.3 PQL		3 RBC		3 RBC	26 RBC	26 RBC
Azobenzene	C	103333		6 RBC	0.6 CALA		0.6 CALA		0.6 CALA		0.6 CALA		6 RBC		6 RBC	52 RBC	52 RBC
Barium and compounds	N	7440393		2000 /260 MCL	550 RBM		550 RBM		14000 RBM		14000 RBM		550 RBM		550 RBM	14000 RBM	14000 RBM
Baygon	N	114261		15 RBM	2 CALA		2 CALA		2 CALA		2 CALA		31 RBM		31 RBM	820 RBM	820 RBM
Baythroid	N	68359375		91 RBM	9 CALA		9 CALA		9 CALA		9 CALA		200 RBM		200 RBM	5000 MAX	5000 MAX
Bentazon	N	25057890		110 RBM	11 CALA		11 CALA		11 CALA		11 CALA		230 RBM		230 RBM	5000 MAX	5000 MAX
Benzaldehyde	N	100527		370 RBM	37 CALA		37 CALA		37 CALA		37 CALA		780 RBM		780 RBM	5000 MAX	5000 MAX
Benzene	C	71432	☒	5 /0.4 MCL	0.5 CALA		0.5 CALA		0.5 CALA		0.5 CALA		0.8 SSLI		0.8 SSLI	200 RBC	200 RBC
Benzenethiol	N	108985	☒	0.006 PQL	6.E-04 PQL		6.E-04 PQL		6.E-04 PQL		6.E-04 PQL		0.08 PQL		0.08 PQL	2 RBM	2 RBM

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Contaminant		CAS	VOC	Ground Water (a) µg/L	Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg	
Benzidine	C	92875		3.E-04 PQL	3.E-05	PQL	3.E-05	PQL	3.E-05	PQL	3.E-05	PQL	0.003	PQL	0.003	PQL	0.03	RBC	0.03	RBC
Benzoic acid	N	65850		15000 RBM	1000	MAX	1000	MAX	1500	CALA	1500	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Benzyl alcohol	N	100516		1100 RBM	110	CALA	110	CALA	110	CALA	110	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Benzyl chloride	C	100447	☒	0.06 PQL	0.006	PQL	0.006	PQL	0.006	PQL	0.006	PQL	4	RBC	4	RBC	34	RBC	34	RBC
Beryllium and compounds	N	7440417		4 MCL	16	RBM	16	RBM	410	RBM	410	RBM	16	RBM	16	RBM	410	RBM	410	RBM
1,1-Biphenyl	N	92524		30 RBM	3	CALA	3	CALA	3	CALA	3	CALA	390	RBM	390	RBM	5000	MAX	5000	MAX
Bis(2-chloroethyl)ether	C	111444	☒	0.01 PQL	0.001	PQL	0.001	PQL	0.001	PQL	0.001	PQL	0.2	SSLI	0.2	PQL	5	RBC	5	RBC
Bis(2-chloroisopropyl)ether	C	108601	☒	300 /0.3 HAL	9	RBC	9	RBC	30	CALA	30	CALA	9	RBC	9	RBC	82	RBC	82	RBC
Bis(chloromethyl)ether	C	542881	☒	5.E-05 PQL	5.E-06	PQL	5.E-06	PQL	5.E-06	PQL	5.E-06	PQL	0.003	PQL	0.003	PQL	0.03	RBC	0.03	RBC
Bis(2-ethylhexyl)phthalate (DEHP)	C	117817		6 /5 MCL	46	RBC	46	RBC	130	CALB	130	CALB	46	RBC	46	RBC	410	RBC	410	RBC
Boron (and borates)	N	7440428		600 HAL	60	CALA	60	CALA	60	CALA	60	CALA	700	RBM	700	RBM	18000	RBM	18000	RBM
Bromodichloromethane	C	75274	☒	100 /0.2 MCL	10	CALA	10	CALA	10	CALA	10	CALA	10	RBC	10	RBC	92	RBC	92	RBC
Bromoform (tribromomethane)	C	75252	☒	100 /8 MCL	10	CALA	10	CALA	10	CALA	10	CALA	53	SSLI	53	SSLI	720	RBC	720	RBC
Bromomethane	C	74839	☒	10 /9 HAL	1	CALA	1	CALA	1	CALA	1	CALA	11	RBC	11	RBC	290	RBC	290	RBC
Bromophos	N	2104963		18 RBM	2	CALA	2	CALA	2	CALA	2	CALA	39	RBM	39	RBM	1000	RBM	1000	RBM
1-Butanol	N	71363		370 RBM	37	CALA	37	CALA	37	CALA	37	CALA	780	RBM	780	RBM	5000	MAX	5000	MAX
N-Butylbenzene	N	104518	☒	6 RBM	0.6	CALA	0.6	CALA	0.6	CALA	0.6	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
Butyl benzyl phthalate	N	85687		730 RBM	930	SSLI	930	SSLI	5000	CALB	5000	CALB	930	SSLI	930	SSLI	5000	MAX	5000	MAX
Butylate	N	2008415		180 RBM	18	CALA	18	CALA	18	CALA	18	CALA	390	RBM	390	RBM	5000	MAX	5000	MAX
sec-Butylbenzene	N	135988	☒	6 RBM	0.6	CALA	0.6	CALA	0.6	CALA	0.6	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
tert-Butylbenzene	N	104518	☒	6 RBM	0.6	CALA	0.6	CALA	0.6	CALA	0.6	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
Cadmium and compounds	N	7440439		5 MCL	4	RBM	4	RBM	38	CALB	38	CALB	4	RBM	4	RBM	100	RBM	100	RBM
Caprolactam	N	105602		1800 RBM	180	CALA	180	CALA	180	CALA	180	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Carbaryl	N	63252		700 HAL	70	CALA	70	CALA	70	CALA	70	CALA	780	RBM	780	RBM	5000	MAX	5000	MAX
Carbon disulfide	N	75150	☒	100 RBM	10	CALA	10	CALA	10	CALA	10	CALA	780	RBM	780	RBM	5000	MAX	5000	MAX
Carbon tetrachloride	C	56235	☒	5 /2 MCL	0.3	SSLI	0.3	PQL	0.5	CALA	0.5	CALA	0.3	SSLI	0.3	PQL	44	RBC	44	RBC
Carbosulfan	N	55285148		37 RBM	4	CALA	4	CALA	4	CALA	4	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
Chloral	N	75876		7 RBM	0.7	CALA	0.7	CALA	0.7	CALA	0.7	CALA	16	RBM	16	RBM	410	RBM	410	RBM
Chloranil	C	118752		0.2 RBC	0.02	PQL	0.02	PQL	0.02	PQL	0.02	PQL	2	RBC	2	RBC	14	RBC	14	RBC
Chlordane	C	57749		2 /0.2 MCL	2	RBC	2	RBC	16	RBC	16	RBC	2	RBC	2	RBC	16	RBC	16	RBC
Chlorine	N	7782505		61 RBM	6	CALA	6	CALA	6	CALA	6	CALA	780	RBM	780	RBM	5000	MAX	5000	MAX
Chloroacetic acid	N	79118		7 RBM	0.7	CALA	0.7	CALA	0.7	CALA	0.7	CALA	16	RBM	16	RBM	410	RBM	410	RBM

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			VOC	Ground Water (a)	Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil	
Contaminant		CAS		µg/L	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
4-Chloroaniline	N	106478		15 RBM	2	CALB	2	CALB	2	CALB	2	CALB	31	RBM	31	RBM	820	RBM	820	RBM
Chlorobenzene	N	108907	☒	100 /11 MCL	10	CALA	10	CALA	10	CALA	10	CALA	130	SSLI	130	SSLI	4100	MAX	4100	MAX
Chlorobenzilate	C	510156		0.3 RBC	2	RBC	2	RBC	7	CALB	7	CALB	2	RBC	2	RBC	21	RBC	21	RBC
p-Chlorobenzoic acid	N	74113		730 RBM	73	CALA	73	CALA	73	CALA	73	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
2-Chloro-1,3-butadiene	N	126998	☒	1 RBM	0.1	PQL	0.1	PQL	0.1	PQL	0.1	PQL	160	RBM	160	RBM	4100	RBM	4100	RBM
1-Chlorobutane	N	109693	☒	240 RBM	24	CALA	24	CALA	24	CALA	24	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Chloroethane	C	75003	☒	4 RBC	0.4	PQL	0.4	PQL	0.4	PQL	0.4	PQL	220	RBC	220	RBC	2000	RBC	2000	RBC
Chloroform	C	67663	☒	100 /0.1 MCL	0.3	SSLI	0.3	PQL	10	CALA	10	CALA	0.3	SSLI	0.3	PQL	940	RBC	940	RBC
Chloromethane	C	74873	☒	3 /2 HAL	0.3	PQL	0.3	PQL	0.3	PQL	0.3	PQL	49	RBC	49	RBC	440	RBC	440	RBC
4-Chloro-2-methylaniline	C	95692		0.1 PQL	0.01	PQL	0.01	PQL	0.01	PQL	0.01	PQL	1	RBC	1	RBC	10	RBC	10	RBC
beta-Chloronaphthalene	N	91587	☒	49 RBM	620	CALB	620	CALB	620	CALB	620	CALB	630	RBM	630	RBM	5000	MAX	5000	MAX
o-Chloronitrobenzene	C	88733	☒	0.4 RBC	0.04	PQL	0.04	PQL	0.04	PQL	0.04	PQL	26	RBC	26	RBC	230	RBC	230	RBC
p-Chloronitrobenzene	C	100005	☒	0.6 RBC	0.06	PQL	0.06	PQL	0.06	PQL	0.06	PQL	35	RBC	35	RBC	320	RBC	320	RBC
2-Chlorophenol	N	95578	☒	40 /30 HAL	4	CALA	4	CALA	4	CALA	4	CALA	39	RBM	39	RBM	1000	RBM	1000	RBM
o-Chlorotoluene	N	95498	☒	12 RBM	5	CALB	5	CALB	5	CALB	5	CALB	160	RBM	160	RBM	4100	RBM	4100	RBM
Chlorpyrifos	N	2921882		20 HAL	23	CALB	23	CALB	23	CALB	23	CALB	23	RBM	23	RBM	610	RBM	610	RBM
Chlorpyrifos-methyl	N	5598130		37 RBM	30	CALB	30	CALB	30	CALB	30	CALB	78	RBM	78	RBM	2000	RBM	2000	RBM
Chromium III and compounds	N	16065831		100 MCL	12000	RBM	12000	RBM	310000	RBM	310000	RBM	12000	RBM	12000	RBM	310000	RBM	310000	RBM
Chromium VI and compounds	N	18540299		11 RBM	35	CALB	35	CALB	35	CALB	35	CALB	270	SSLI	270	SSLI	610	RBM	610	RBM
Cobalt	N	7440484		220 RBM	22	CALA	22	CALA	22	CALA	22	CALA	470	RBM	470	RBM	12000	RBM	12000	RBM
Copper and compounds	N	7440508		1300 MCL	310	RBM	310	RBM	8200	RBM	8200	RBM	310	RBM	310	RBM	8200	RBM	8200	RBM
Crotonaldehyde	C	123739	☒	0.006 PQL	6.E-04	PQL	6.E-04	PQL	6.E-04	PQL	6.E-04	PQL	0.3	PQL	0.3	PQL	3	RBC	3	RBC
Cumene	N	98828	☒	66 RBM	110	CALB	110	CALB	110	CALB	110	CALB	780	RBM	780	RBM	5000	MAX	5000	MAX
Cyanides:																				
Calcium cyanide	N	592018		150 RBM	15	CALA	15	CALA	15	CALA	15	CALA	310	RBM	310	RBM	5000	MAX	5000	MAX
Copper cyanide	N	544923		18 RBM	2	CALA	2	CALA	2	CALA	2	CALA	39	RBM	39	RBM	1000	RBM	1000	RBM
Cyanazine	C	21725462		0.08 PQL	0.01	PQL	0.01	PQL	0.01	PQL	0.01	PQL	0.8	RBC	0.8	RBC	7	RBC	7	RBC
Cyanogen	N	460195	☒	24 RBM	2	CALA	2	CALA	2	CALA	2	CALA	310	RBM	310	RBM	5000	MAX	5000	MAX
Cyanogen bromide	N	506683		330 RBM	33	CALA	33	CALA	33	CALA	33	CALA	700	RBM	700	RBM	5000	MAX	5000	MAX
Cyanogen chloride	N	506774		180 RBM	18	CALA	18	CALA	18	CALA	18	CALA	390	RBM	390	RBM	5000	MAX	5000	MAX
Free cyanide	N	57125		200 MCL	160	RBM	160	RBM	200	CALB	200	CALB	160	RBM	160	RBM	4100	RBM	4100	RBM
Hydrogen cyanide	N	74908	☒	0.6 RBM	0.06	PQL	0.06	PQL	0.06	PQL	0.06	PQL	160	RBM	160	RBM	4100	RBM	4100	RBM

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Potassium cyanide	N	151508		180 RBM	18 CALA	18 CALA	18 CALA	18 CALA	390 RBM	390 RBM	5000 MAX	5000 MAX
Potassium silver cyanide	N	506616		730 RBM	73 CALA	73 CALA	73 CALA	73 CALA	1000 MAX	1000 MAX	5000 MAX	5000 MAX
Silver cyanide	N	506649		370 RBM	37 CALA	37 CALA	37 CALA	37 CALA	780 RBM	780 RBM	5000 MAX	5000 MAX
Sodium cyanide	N	143339		150 RBM	15 CALA	15 CALA	15 CALA	15 CALA	310 RBM	310 RBM	5000 MAX	5000 MAX
Thiocyanate	N	0		370 RBM	37 CALA	37 CALA	37 CALA	37 CALA	780 RBM	780 RBM	5000 MAX	5000 MAX
Zinc cyanide	N	557211		180 RBM	18 CALA	18 CALA	18 CALA	18 CALA	390 RBM	390 RBM	5000 MAX	5000 MAX
Cyclohexanone	N	108941	☒	18000 RBM	1000 MAX	1000 MAX	1800 CALA	1800 CALA	1000 MAX	1000 MAX	5000 MAX	5000 MAX
Cyhalothrin/Karate	N	68085858		18 RBM	2 CALA	2 CALA	2 CALA	2 CALA	39 RBM	39 RBM	1000 RBM	1000 RBM
Cypermethrin	N	52315078		37 RBM	4 CALA	4 CALA	4 CALA	4 CALA	78 RBM	78 RBM	2000 RBM	2000 RBM
Dacthal	N	1861321		37 RBM	4 CALA	4 CALA	4 CALA	4 CALA	78 RBM	78 RBM	2000 RBM	2000 RBM
Dalapon	N	75990		200 MCL	20 CALA	20 CALA	20 CALA	20 CALA	230 RBM	230 RBM	5000 MAX	5000 MAX
DDD	C	72548		0.3 RBC	3 RBC	3 RBC	3 CALB	3 CALB	3 RBC	3 RBC	24 RBC	24 RBC
DDE	C	72559		0.2 RBC	2 RBC	2 RBC	4 CALB	4 CALB	2 RBC	2 RBC	17 RBC	17 RBC
DDT	C	50293		0.2 RBC	2 RBC	2 RBC	12 CALB	12 CALB	2 RBC	2 RBC	17 RBC	17 RBC
Diazinon	N	333415		0.6 HAL	0.06 PQL	0.06 PQL	0.06 PQL	0.06 PQL	7 RBM	7 RBM	180 RBM	180 RBM
Dibenzofuran	N	132649	☒	2 RBM	0.2 PQL	0.2 PQL	0.2 PQL	0.2 PQL	31 RBM	31 RBM	820 RBM	820 RBM
1,4-Dibromobenzene	N	106376	☒	37 RBM	4 CALA	4 CALA	4 CALA	4 CALA	78 RBM	78 RBM	2000 RBM	2000 RBM
Dibromochloromethane	C	124481	☒	0.1 PQL	0.01 PQL	0.01 PQL	0.01 PQL	0.01 PQL	8 RBC	8 RBC	68 RBC	68 RBC
1,2-Dibromo-3-chloropropane	C	96128	☒	0.2 /0.05 MCL	0.02 PQL	0.02 PQL	0.02 PQL	0.02 PQL	0.5 RBC	0.5 RBC	4 RBC	4 RBC
1,2-Dibromoethane	C	106934	☒	0.05 /0.001 MCL	0.008 PQL	0.008 PQL	0.01 PQL	0.01 PQL	0.008 PQL	0.008 PQL	0.07 PQL	0.07 PQL
Dibutyl phthalate	N	84742		370 RBM	780 RBM	780 RBM	1500 CALB	1500 CALB	780 RBM	780 RBM	5000 MAX	5000 MAX
Dicamba	N	1918009		110 RBM	11 CALA	11 CALA	11 CALA	11 CALA	230 RBM	230 RBM	5000 MAX	5000 MAX
1,2-Dichlorobenzene	N	95501	☒	600 /64 MCL	60 CALA	60 CALA	60 CALA	60 CALA	560 SSLI	560 SSLI	5000 MAX	5000 MAX
1,3-Dichlorobenzene	N	541731	☒	600 /0.5 HAL	61 CALB	61 CALB	61 CALB	61 CALB	230 RBM	230 RBM	5000 MAX	5000 MAX
1,4-Dichlorobenzene	C	106467	☒	75 /0.4 MCL	10 CALB	10 CALB	10 CALB	10 CALB	27 RBC	27 RBC	240 RBC	240 RBC
3,3'-Dichlorobenzidine	C	91941		0.2 RBC	1 RBC	1 RBC	6 CALB	6 CALB	1 RBC	1 RBC	13 RBC	13 RBC
Dichlorodifluoromethane (Freon 12)	N	75718	☒	1000 /350 HAL	100 CALB	100 CALB	100 CALB	100 CALB	1000 MAX	1000 MAX	5000 MAX	5000 MAX
1,1-Dichloroethane	N	75343	☒	81 RBM	8 CALA	8 CALA	8 CALA	8 CALA	780 RBM	780 RBM	5000 MAX	5000 MAX
1,2-Dichloroethane (EDC)	C	107062	☒	5 /0.1 MCL	0.4 SSLI	0.4 PQL	0.5 CALA	0.5 CALA	0.4 SSLI	0.4 PQL	63 RBC	63 RBC
1,1-Dichloroethylene	C	75354	☒	7 /0.04 MCL	0.07 SSLI	0.07 SSLI	0.7 CALA	0.7 CALA	0.07 SSLI	0.07 SSLI	10 RBC	10 RBC
1,2-Dichloroethylene (cis)	N	156592	☒	70 /61 MCL	7 CALA	7 CALA	7 CALA	7 CALA	78 RBM	78 RBM	2000 RBM	2000 RBM
1,2-Dichloroethylene (trans)	N	156605	☒	100 MCL	10 CALA	10 CALA	10 CALA	10 CALA	160 RBM	160 RBM	4100 RBM	4100 RBM

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			VOC	Ground Water (a)	Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil	
Contaminant		CAS		µg/L	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
1,2-Dichloroethylene (mixture)	N	540590	☒	6 RBM	0.6 CALA		0.6 CALA		0.6 CALA		0.6 CALA		70 RBM		70 RBM		1800 RBM		1800 RBM	
2,4-Dichlorophenol	N	120832		20 HAL	2 CALA		2 CALA		2 CALA		2 CALA		23 RBM		23 RBM		610 RBM		610 RBM	
2,4-Dichlorophenoxyacetic Acid (2,4-D)	N	94757	☒	70 /37 MCL	7 CALA		7 CALA		7 CALA		7 CALA		78 RBM		78 RBM		2000 RBM		2000 RBM	
4-(2,4-Dichlorophenoxy)butyric Acid	N	94826		29 RBM	3 CALA		3 CALA		3 CALA		3 CALA		63 RBM		63 RBM		1600 RBM		1600 RBM	
1,2-Dichloropropane	C	78875	☒	5 /0.2 MCL	0.5 CALA		0.5 CALA		0.5 CALA		0.5 CALA		9 RBC		9 RBC		84 RBC		84 RBC	
2,3-Dichloropropanol	N	616239		11 RBM	1 CALA		1 CALA		1 CALA		1 CALA		23 RBM		23 RBM		610 RBM		610 RBM	
1,3-Dichloropropene	C	542756	☒	0.08 PQL	0.008 PQL		0.008 PQL		0.008 PQL		0.008 PQL		0.1 SSLI		0.1 PQL		32 RBC		32 RBC	
Dichlorvos	C	62737		0.2 RBC	0.02 PQL		0.02 PQL		0.02 PQL		0.02 PQL		2 RBC		2 RBC		20 RBC		20 RBC	
Dicofol	C	115322		0.2 RBC	0.02 PQL		0.02 PQL		0.02 PQL		0.02 PQL		2 RBC		2 RBC		13 RBC		13 RBC	
Dicyclopentadiene	N	77736	☒	0.4 RBM	0.04 PQL		0.04 PQL		0.04 PQL		0.04 PQL		230 RBM		230 RBM		5000 MAX		5000 MAX	
Dieldrin	C	60571		0.004 PQL	0.04 PQL		0.04 PQL		0.1 PQL		0.1 PQL		0.04 PQL		0.04 PQL		0.4 PQL		0.4 PQL	
Diethyl phthalate	N	84662		5000 HAL	500 CALA		500 CALA		500 CALA		500 CALA		1000 MAX		1000 MAX		5000 MAX		5000 MAX	
Diethylene glycol, monoethyl ether	N	111900		7300 RBM	730 CALA		730 CALA		730 CALA		730 CALA		1000 MAX		1000 MAX		5000 MAX		5000 MAX	
Di(2-ethylhexyl)adipate	C	103231		400 /56 MCL	40 CALA		40 CALA		40 CALA		40 CALA		530 RBC		530 RBC		4800 RBC		4800 RBC	
Diethylstilbestrol	C	56531		1.E-05 PQL	1.E-04 PQL		1.E-04 PQL		0.001 PQL		0.001 PQL		1.E-04 PQL		1.E-04 PQL		0.001 PQL		0.001 PQL	
Difenzoquat (Avenge)	N	43222486		290 RBM	29 CALA		29 CALA		29 CALA		29 CALA		630 RBM		630 RBM		5000 MAX		5000 MAX	
Diisopropyl methylphosphonate (DIMP)	N	1445756		290 RBM	29 CALA		29 CALA		29 CALA		29 CALA		630 RBM		630 RBM		5000 MAX		5000 MAX	
3,3'-Dimethoxybenzidine	C	119904		5 RBC	0.5 CALA		0.5 CALA		0.5 CALA		0.5 CALA		46 RBC		46 RBC		410 RBC		410 RBC	
2,4-Dimethylaniline hydrochloride	C	21436964		0.1 PQL	0.01 PQL		0.01 PQL		0.01 PQL		0.01 PQL		1 RBC		1 RBC		10 RBC		10 RBC	
2,4-Dimethylaniline	C	95681		0.09 PQL	0.009 PQL		0.009 PQL		0.009 PQL		0.009 PQL		0.9 RBC		0.9 RBC		8 RBC		8 RBC	
N-N-Dimethylaniline	N	121697		7 RBM	0.7 CALA		0.7 CALA		0.7 CALA		0.7 CALA		16 RBM		16 RBM		410 RBM		410 RBM	
3,3'-Dimethylbenzidine	C	119937		0.07 PQL	0.007 PQL		0.007 PQL		0.007 PQL		0.007 PQL		0.07 PQL		0.07 PQL		0.6 RBC		0.6 RBC	
1,1-Dimethylhydrazine	C	57147		0.03 PQL	0.003 PQL		0.003 PQL		0.003 PQL		0.003 PQL		0.3 PQL		0.3 PQL		2 RBC		2 RBC	
1,2-Dimethylhydrazine	C	540738		0.002 PQL	2.E-04 PQL		2.E-04 PQL		2.E-04 PQL		2.E-04 PQL		0.02 PQL		0.02 PQL		0.2 PQL		0.2 PQL	
2,4-Dimethylphenol	N	105679		73 RBM	7 CALA		7 CALA		7 CALA		7 CALA		160 RBM		160 RBM		4100 RBM		4100 RBM	
2,6-Dimethylphenol	N	576261		2 RBM	0.2 PQL		0.2 PQL		0.2 PQL		0.2 PQL		5 RBM		5 RBM		120 RBM		120 RBM	
3,4-Dimethylphenol	N	95658		4 RBM	0.4 PQL		0.4 PQL		0.4 PQL		0.4 PQL		8 RBM		8 RBM		200 RBM		200 RBM	
Dimethyl phthalate	N	131113		37000 RBM	1000 MAX		1000 MAX		3700 CALA		3700 CALA		1000 MAX		1000 MAX		5000 MAX		5000 MAX	
1,2-Dinitrobenzene	N	528290		2 RBM	0.2 PQL		0.2 PQL		0.2 PQL		0.2 PQL		3 RBM		3 RBM		82 RBM		82 RBM	
1,3-Dinitrobenzene	N	99650		1 HAL	0.1 PQL		0.1 PQL		0.1 PQL		0.1 PQL		1 RBM		1 RBM		20 RBM		20 RBM	
1,4-Dinitrobenzene	N	100254		2 RBM	0.2 PQL		0.2 PQL		0.2 PQL		0.2 PQL		3 RBM		3 RBM		82 RBM		82 RBM	
4,6-Dinitro-o-cyclohexyl phenol	N	131895		7 RBM	0.7 CALA		0.7 CALA		0.7 CALA		0.7 CALA		16 RBM		16 RBM		410 RBM		410 RBM	

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Contaminant		CAS		µg/L	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
4,6-Dinitro-2-Methylphenol	N	534521		0.4 RBM	0.04	PQL	0.04	PQL	0.04	PQL	0.04	PQL	0.08	PQL	0.08	PQL	2	RBM	2	RBM
2,4-Dinitrophenol	N	51285		7 RBM	0.7	CALA	0.7	CALA	0.7	CALA	0.7	CALA	16	RBM	16	RBM	410	RBM	410	RBM
Dinitrotoluene Mix	C			0.1 PQL	0.01	PQL	0.01	PQL	0.01	PQL	0.01	PQL	1	RBC	1	RBC	8	RBC	8	RBC
2,4-Dinitrotoluene	N	121142		7 RBM	0.7	CALA	0.7	CALA	0.7	CALA	0.7	CALA	16	RBM	16	RBM	410	RBM	410	RBM
2,6-Dinitrotoluene	N	606202		4 RBM	0.4	PQL	0.4	PQL	0.4	PQL	0.4	PQL	8	RBM	8	RBM	200	RBM	200	RBM
Dinoseb	N	88857		7 /4 MCL	0.7	CALA	0.7	CALA	0.7	CALA	0.7	CALA	8	RBM	8	RBM	200	RBM	200	RBM
di-n-Octyl phthalate	N	117840		73 RBM	7	CALA	7	CALA	7	CALA	7	CALA	160	RBM	160	RBM	4100	RBM	4100	RBM
1,4-Dioxane	C	123911		6 RBC	0.6	CALA	0.6	CALA	0.6	CALA	0.6	CALA	58	RBC	58	RBC	520	RBC	520	RBC
Diphenylamine	N	122394		200 HAL	20	CALA	20	CALA	20	CALA	20	CALA	200	RBM	200	RBM	5000	MAX	5000	MAX
1,2-Diphenylhydrazine	C	122667		0.08 PQL	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	0.8	RBC	0.8	RBC	7	RBC	7	RBC
Diquat	N	85007		20 MCL	2	CALA	2	CALA	2	CALA	2	CALA	17	RBM	17	RBM	450	RBM	450	RBM
Disulfoton	N	298044		0.3 /0.2 HAL	0.08	PQL	0.08	PQL	0.08	PQL	0.08	PQL	0.3	PQL	0.3	PQL	8	RBM	8	RBM
1,4-Dithiane	N	505293		37 RBM	4	CALA	4	CALA	4	CALA	4	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
Diuron	N	330541		10 HAL	1	CALA	1	CALA	1	CALA	1	CALA	16	RBM	16	RBM	410	RBM	410	RBM
Endosulfan	N	115297		22 RBM	47	RBM	47	RBM	110	CALB	110	CALB	47	RBM	47	RBM	1200	RBM	1200	RBM
Endothall	N	145733		100 MCL	10	CALA	10	CALA	10	CALA	10	CALA	160	RBM	160	RBM	4100	RBM	4100	RBM
Endrin	N	72208		2 MCL	2	RBM	2	RBM	6	CALB	6	CALB	2	RBM	2	RBM	61	RBM	61	RBM
Epichlorohydrin	C	106898		0.1 MCL	0.01	PQL	0.01	PQL	0.01	PQL	0.01	PQL	65	RBC	65	RBC	580	RBC	580	RBC
Ethion	N	563122		2 RBM	4	RBM	4	RBM	4	CALB	4	CALB	4	RBM	4	RBM	100	RBM	100	RBM
2-Ethoxyethanol	N	110805		1500 RBM	150	CALA	150	CALA	150	CALA	150	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Ethyl acetate	N	141786		550 RBM	55	CALA	55	CALA	55	CALA	55	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Ethylbenzene	N	100414	☒	700 MCL	70	CALA	70	CALA	70	CALA	70	CALA	400	SSLI	400	SSLI	5000	MAX	5000	MAX
Ethylene diamine	N	107153		73 RBM	7	CALA	7	CALA	7	CALA	7	CALA	160	RBM	160	RBM	4100	RBM	4100	RBM
Ethylene glycol	N	107211		7000 HAL	700	CALA	700	CALA	700	CALA	700	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Ethylene oxide	C	75218	☒	0.02 PQL	0.002	PQL	0.002	PQL	0.002	PQL	0.002	PQL	0.6	RBC	0.6	RBC	6	RBC	6	RBC
Ethylene thiourea (ETU)	C	96457		0.6 RBC	0.06	PQL	0.06	PQL	0.06	PQL	0.06	PQL	6	RBC	5	RBC	52	RBC	48	RBC
Ethyl ether	N	60297	☒	120 RBM	12	CALA	12	CALA	12	CALA	12	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Ethyl methacrylate	N	97632		55 RBM	6	CALA	6	CALA	6	CALA	6	CALA	700	RBM	700	RBM	5000	MAX	5000	MAX
Fenamiphos	N	22224926		2 HAL	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	2	RBM	2	RBM	51	RBM	51	RBM
Fluometuron	N	2164172		47 RBM	5	CALA	5	CALA	5	CALA	5	CALA	100	RBM	100	RBM	2700	RBM	2700	RBM
Fluorine	N	7782414		220 RBM	22	CALA	22	CALA	22	CALA	22	CALA	470	RBM	470	RBM	5000	MAX	5000	MAX
Fomesafen	C	72178020		0.4 RBC	0.04	PQL	0.04	PQL	0.04	PQL	0.04	PQL	3	RBC	3	RBC	30	RBC	30	RBC

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Contaminant		CAS	VOC	Ground Water (a) µg/L	Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg	
Fonofos	N	944229		10 HAL	3	CALB	3	CALB	3	CALB	3	CALB	16	RBM	16	RBM	410	RBM	410	RBM
Formaldehyde	N	50000		1000 HAL	100	CALA	100	CALA	100	CALA	100	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Formic Acid	N	64186		7300 RBM	730	CALA	730	CALA	730	CALA	730	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Furan	N	110009	☒	0.6 RBM	0.06	PQL	0.06	PQL	0.06	PQL	0.06	PQL	8	RBM	8	RBM	200	RBM	200	RBM
Furazolidone	C	67458		0.2 RBC	0.02	PQL	0.02	PQL	0.02	PQL	0.02	PQL	0.2	PQL	0.2	PQL	2	RBC	2	RBC
Furfural	N	98011		11 RBM	1	CALA	1	CALA	1	CALA	1	CALA	23	RBM	23	RBM	610	RBM	610	RBM
Glycidaldehyde	N	765344		2 RBM	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	3	RBM	3	RBM	82	RBM	82	RBM
Glyphosate	N	1071836		700 MCL	620	CALB	620	CALB	620	CALB	620	CALB	780	RBM	780	RBM	5000	MAX	5000	MAX
HCH (alpha)	C	319846		0.01 PQL	0.001	PQL	0.001	PQL	0.001	PQL	0.001	PQL	0.1	PQL	0.1	PQL	0.9	RBC	0.9	RBC
HCH (beta)	C	319857		0.04 PQL	0.004	PQL	0.004	PQL	0.004	PQL	0.004	PQL	0.4	PQL	0.4	PQL	3	RBC	3	RBC
HCH (gamma) Lindane	C	58899		0.2 /0.05 MCL	0.07	PQL	0.07	PQL	0.07	PQL	0.07	PQL	0.5	RBC	0.5	RBC	4	RBC	4	RBC
HCH-technical	C	608731		0.04 PQL	0.004	PQL	0.004	PQL	0.004	PQL	0.004	PQL	0.4	PQL	0.4	PQL	3	RBC	3	RBC
Heptachlor	C	76448	☒	0.4 /0.01 MCL	0.1	RBC	0.1	RBC	0.7	CALB	0.7	CALB	0.1	PQL	0.1	PQL	1	RBC	1	RBC
Heptachlor epoxide	C	1024573	☒	0.2 /0.007 MCL	0.07	PQL	0.07	PQL	0.6	RBC	0.6	RBC	0.07	PQL	0.07	PQL	0.6	RBC	0.6	RBC
Hexabromobenzene	N	87821	☒	7 RBM	0.7	CALA	0.7	CALA	0.7	CALA	0.7	CALA	16	RBM	16	RBM	410	RBM	410	RBM
Hexachlorobenzene	C	118741	☒	1 /0.04 MCL	0.4	PQL	0.4	PQL	1	CALB	1	CALB	0.4	PQL	0.4	PQL	4	RBC	4	RBC
Hexachlorobutadiene	C	87683	☒	1 /0.9 HAL	1	CALB	1	CALB	1	CALB	1	CALB	8	RBC	8	RBC	73	RBC	73	RBC
Hexachlorocyclopentadiene	N	77474	☒	50 /26 MCL	10	SSLI	10	SSLI	90	CALB	90	CALB	10	SSLI	10	SSLI	1400	RBM	1400	RBM
Hexachlorodibenzo-p-dioxin mixture	C	19408743		1.E-05 PQL	1.E-04	PQL	1.E-04	PQL	0.001	PQL	0.001	PQL	1.E-04	PQL	1.E-04	PQL	0.001	PQL	0.001	PQL
Hexachloroethane	C	67721	☒	1 HAL	0.6	CALB	0.6	CALB	0.6	CALB	0.6	CALB	46	RBC	46	RBC	410	RBC	410	RBC
Hexachlorophene	N	70304		1 RBM	0.1	PQL	0.1	PQL	0.1	PQL	0.1	PQL	2	RBM	2	RBM	61	RBM	61	RBM
n-Hexane	N	110543	☒	35 RBM	30	CALB	30	CALB	30	CALB	30	CALB	470	RBM	470	RBM	5000	MAX	5000	MAX
2-Hexanone	N	591786		150 RBM	15	CALA	15	CALA	15	CALA	15	CALA	310	RBM	310	RBM	5000	MAX	5000	MAX
Hexazinone	N	51235042		120 RBM	12	CALA	12	CALA	12	CALA	12	CALA	260	RBM	260	RBM	5000	MAX	5000	MAX
HMX	N	2691410		180 RBM	18	CALA	18	CALA	18	CALA	18	CALA	390	RBM	390	RBM	5000	MAX	5000	MAX
Hydrazine	C	302012		0.02 PQL	0.002	PQL	0.002	PQL	0.002	PQL	0.002	PQL	0.2	PQL	0.2	PQL	2	RBC	2	RBC
Hydrogen sulfide	N	7783064		11 RBM	1	CALA	1	CALA	1	CALA	1	CALA	23	RBM	23	RBM	610	RBM	610	RBM
Hydroquinone	N	123319		150 RBM	15	CALA	15	CALA	15	CALA	15	CALA	310	RBM	310	RBM	5000	MAX	5000	MAX
Iron	N	7439896		300 SMCL	2300	RBM	2300	RBM	61000	RBM	61000	RBM	2300	RBM	2300	RBM	61000	RBM	61000	RBM
Isobutanol	N	78831	☒	180 RBM	18	CALA	18	CALA	18	CALA	18	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Isophorone	C	78591		100 /71 HAL	10	CALA	10	CALA	10	CALA	10	CALA	670	RBC	670	RBC	5000	MAX	5000	MAX
Isopropalin	N	33820530		55 RBM	120	RBM	120	RBM	1000	CALB	1000	CALB	120	RBM	120	RBM	3100	RBM	3100	RBM

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Contaminant		CAS		µg/L	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Isopropyl methyl phosphonic acid	N	1832548		370 RBM	37	CALA	37	CALA	37	CALA	37	CALA	780	RBM	780	RBM	5000	MAX	5000	MAX
Lead	N	7439921		15 EPA	400	EPA	400	EPA	1000	EPA	1000	EPA	400	EPA	400	EPA	1000	EPA	1000	EPA
Lithium	N	7439932		73 RBM	7	CALA	7	CALA	7	CALA	7	CALA	160	RBM	160	RBM	4100	RBM	4100	RBM
Malathion	N	121755		200 HAL	67	CALB	67	CALB	67	CALB	67	CALB	160	RBM	160	RBM	4100	RBM	4100	RBM
Maleic anhydride	N	108316		370 RBM	37	CALA	37	CALA	37	CALA	37	CALA	780	RBM	780	RBM	5000	MAX	5000	MAX
Manganese and compounds	N	7439965		50 SMCL	160	RBM	160	RBM	4100	RBM	4100	RBM	160	RBM	160	RBM	4100	RBM	4100	RBM
Mephosfolan	N	950107		0.3 RBM	0.03	PQL	0.03	PQL	0.03	PQL	0.03	PQL	1	RBM	1	RBM	18	RBM	18	RBM
Mepiquat chloride	N	24307264		110 RBM	11	CALA	11	CALA	11	CALA	11	CALA	230	RBM	230	RBM	5000	MAX	5000	MAX
Mercuric chloride	N	7487947		1 RBM	0.1	PQL	0.1	PQL	0.1	PQL	0.1	PQL	2	RBM	2	RBM	61	RBM	61	RBM
Mercury (inorganic)	N	7439976		2 MCL	10	CALB	10	CALB	10	CALB	10	CALB	10	SSLI	10	SSLI	610	RBC	610	RBC
Mercury (methyl)	N	22967926		0.4 RBM	0.04	PQL	0.04	PQL	0.04	PQL	0.04	PQL	1	RBM	1	RBM	20	RBM	20	RBM
Methacrylonitrile	N	126987	☒	0.1 PQL	0.01	PQL	0.01	PQL	0.01	PQL	0.01	PQL	0.8	RBM	0.8	RBM	20	RBM	20	RBM
Methanol	N	67561		1800 RBM	180	CALA	180	CALA	180	CALA	180	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Methidathion	N	950378		4 RBM	0.4	PQL	0.4	PQL	0.4	PQL	0.4	PQL	8	RBM	8	RBM	200	RBM	200	RBM
Methoxychlor	N	72435		40 MCL	39	RBM	39	RBM	630	CALB	630	CALB	39	RBM	39	RBM	1000	RBM	1000	RBM
Methyl acetate	N	79209	☒	610 RBM	61	CALA	61	CALA	61	CALA	61	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Methyl acrylate	N	96333	☒	18 RBM	2	CALA	2	CALA	2	CALA	2	CALA	230	RBM	230	RBM	5000	MAX	5000	MAX
2-Methylaniline	C	95534		0.3 RBC	0.03	PQL	0.03	PQL	0.03	PQL	0.03	PQL	3	RBC	3	RBC	24	RBC	24	RBC
4-(2-Methyl-4-chlorophenoxy) butyric acid	N	94815		37 RBM	4	CALA	4	CALA	4	CALA	4	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
2-Methyl-4-chlorophenoxyacetic acid	N	94746		2 RBM	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	4	RBM	4	RBM	100	RBM	100	RBM
2-(2-Methyl-14-chlorophenoxy)propionic ac	N	93652		4 RBM	0.4	PQL	0.4	PQL	0.4	PQL	0.4	PQL	8	RBM	8	RBM	200	RBM	200	RBM
Methylene bromide	N	74953	☒	6 RBM	1	CALA	1	CALA	1	CALA	1	CALA	10	SSLI	10	SSLI	5000	MAX	5000	MAX
Methylene chloride	C	75092	☒	5 /4 MCL	0.5	CALA	0.5	CALA	0.5	CALA	0.5	CALA	13	SSLI	13	SSLI	760	RBC	760	RBC
4,4'-Methylene bis(2-chloroaniline)	C	101144		0.5 RBC	0.05	PQL	0.05	PQL	0.05	PQL	0.05	PQL	5	RBC	5	RBC	44	RBC	44	RBC
4,4'-Methylene bis(N,N'-dimethyl)aniline	C	101611		2 RBC	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	14	RBC	14	RBC	120	RBC	120	RBC
Methyl ethyl ketone	N	78933	☒	190 RBM	19	CALA	19	CALA	19	CALA	19	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Methyl hydrazine	C	60344		0.06 PQL	0.006	PQL	0.006	PQL	0.006	PQL	0.006	PQL	0.6	RBC	0.6	RBC	5	RBC	5	RBC
Methyl isobutyl ketone	N	108101	☒	14 RBM	1	CALA	1	CALA	1	CALA	1	CALA	630	RBM	630	RBM	5000	MAX	5000	MAX
Methyl methacrylate	N	80626	☒	140 RBM	14	CALA	14	CALA	14	CALA	14	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
2-Methyl-5-nitroaniline	C	99558		2 RBC	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	19	RBC	19	RBC	170	RBC	170	RBC
Methyl parathion	N	298000		2 HAL	0.4	PQL	0.4	PQL	0.4	PQL	0.4	PQL	2	RBM	2	RBM	51	RBM	51	RBM
2-Methylphenol (o-cresol)	N	95487		180 RBM	18	CALA	18	CALA	18	CALA	18	CALA	390	RBM	390	RBM	5000	MAX	5000	MAX

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			VOC	Ground Water (a)	Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil	
Contaminant		CAS		µg/L	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
3-Methylphenol (m-cresol)	N	103394		180 RBM	18 CALA		18 CALA		18 CALA		18 CALA		390 RBM		390 RBM		5000 MAX		5000 MAX	
4-Methylphenol (p-cresol)	N	106445		18 RBM	2 CALA		2 CALA		2 CALA		2 CALA		39 RBM		39 RBM		5000 MAX		5000 MAX	
Methyl styrene (mixture)	N	25013154	☒	6 RBM	0.6 CALA		0.6 CALA		0.6 CALA		0.6 CALA		47 RBM		47 RBM		1200 RBM		1200 RBM	
Methyl styrene (alpha)	N	98839	☒	43 RBM	4 CALA		4 CALA		4 CALA		4 CALA		550 RBM		550 RBM		5000 MAX		5000 MAX	
Methyl tertbutyl ether (MTBE)	N	1634044	☒	20 HAL	2 CALA		2 CALA		2 CALA		2 CALA		39 RBM		39 RBM		1000 RBM		1000 RBM	
Metolaclor (Dual)	N	51218452		550 RBM	55 CALA		55 CALA		55 CALA		55 CALA		1000 MAX		1000 MAX		5000 MAX		5000 MAX	
Mirex	N	2385855		7 RBM	0.7 CALA		0.7 CALA		0.7 CALA		0.7 CALA		2 RBM		2 RBM		41 RBM		41 RBM	
Molybdenum	N	7439987		18 RBM	2 CALA		2 CALA		2 CALA		2 CALA		39 RBM		39 RBM		1000 RBM		1000 RBM	
Monochloramine	N	10599903		370 RBM	37 CALA		37 CALA		37 CALA		37 CALA		780 RBM		780 RBM		5000 MAX		5000 MAX	
Naled	N	300765		7 RBM	0.7 CALA		0.7 CALA		0.7 CALA		0.7 CALA		16 RBM		16 RBM		410 RBM		410 RBM	
Nickel and compounds	N	7440020		100 HAL	160 RBM		160 RBM		650 CALB		650 CALB		160 RBM		160 RBM		4100 RBM		4100 RBM	
Nitrate	N	14797558		10000 MCL	13000 CALA		13000 CALA		13000 CALA		13000 CALA		13000 RBM		13000 RBM		330000 RBM		330000 RBM	
Nitric oxide	N	10102439		61 RBM	6 CALA		6 CALA		6 CALA		6 CALA		780 RBM		780 RBM		20000 RBM		20000 RBM	
Nitrite	N	14797650		1000 MCL	100 CALA		100 CALA		100 CALA		100 CALA		780 RBM		780 RBM		20000 RBM		20000 RBM	
2-Nitroaniline	N	88744		0.2 RBM	0.02 PQL		0.02 PQL		0.02 PQL		0.02 PQL		0.5 RBM		0.5 RBM		12 RBM		12 RBM	
Nitrobenzene	N	98953	☒	0.4 RBM	0.04 PQL		0.04 PQL		0.04 PQL		0.04 PQL		4 RBM		4 RBM		100 RBM		100 RBM	
Nitrofurantoin	N	67209		260 RBM	26 CALA		26 CALA		26 CALA		26 CALA		550 RBM		550 RBM		5000 MAX		5000 MAX	
Nitrofurazone	C	59870		0.05 PQL	0.005 PQL		0.005 PQL		0.005 PQL		0.005 PQL		0.4 PQL		0.4 PQL		4 RBC		4 RBC	
Nitrogen dioxide	N	10102440	☒	610 RBM	61 CALA		61 CALA		61 CALA		61 CALA		1000 MAX		1000 MAX		5000 MAX		5000 MAX	
Nitroglycerin	C	55630		5 RBC	0.5 CALA		0.5 CALA		0.5 CALA		0.5 CALA		46 RBC		46 RBC		410 RBC		410 RBC	
4-Nitrophenol	N	100027		60 HAL	6 CALA		6 CALA		6 CALA		6 CALA		63 RBM		63 RBM		1600 RBM		1600 RBM	
N-Nitrosodi-n-butylamine	C	924163	☒	0.002 PQL	2.E-04 PQL		2.E-04 PQL		2.E-04 PQL		2.E-04 PQL		0.1 PQL		0.1 PQL		1 RBC		1 RBC	
N-Nitrosodiethanolamine	C	1116547		0.02 PQL	0.002 PQL		0.002 PQL		0.002 PQL		0.002 PQL		0.2 PQL		0.2 PQL		2 RBC		2 RBC	
N-Nitrosodiethylamine	C	55185		5.E-04 PQL	5.E-05 PQL		5.E-05 PQL		5.E-05 PQL		5.E-05 PQL		0.004 PQL		0.004 PQL		0.04 PQL		0.04 PQL	
N-Nitrosodimethylamine	C	62759		0.001 PQL	1.E-04 PQL		1.E-04 PQL		1.E-04 PQL		1.E-04 PQL		0.01 PQL		0.01 PQL		0.1 PQL		0.1 PQL	
N-Nitrosodiphenylamine	C	86306		14 RBC	2 CALB		2 CALB		2 CALB		2 CALB		130 RBC		130 RBC		1200 RBC		1200 RBC	
N-Nitroso di-n-propylamine	C	621647		0.01 PQL	0.001 PQL		0.001 PQL		0.001 PQL		0.001 PQL		0.09 PQL		0.09 PQL		0.8 RBC		0.8 RBC	
N-Nitroso-N-ethylurea	C	759739		5.E-04 PQL	5.E-05 PQL		5.E-05 PQL		5.E-05 PQL		5.E-05 PQL		0.005 PQL		0.005 PQL		0.04 PQL		0.04 PQL	
N-Nitroso-N-methylethylamine	C	10595956		0.003 PQL	3.E-04 PQL		3.E-04 PQL		3.E-04 PQL		3.E-04 PQL		0.03 PQL		0.03 PQL		0.3 PQL		0.3 PQL	
N-Nitrosopyrrolidine	C	930552		0.03 PQL	0.003 PQL		0.003 PQL		0.003 PQL		0.003 PQL		0.3 PQL		0.3 PQL		3 RBC		3 RBC	
m-Nitrotoluene	N	99081	☒	12 RBM	1 CALA		1 CALA		1 CALA		1 CALA		160 RBM		160 RBM		410 RBM		410 RBM	
o-Nitrotoluene	N	88722	☒	6 RBM	0.6 CALA		0.6 CALA		0.6 CALA		0.6 CALA		78 RBM		78 RBM		2000 RBM		2000 RBM	

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			VOC	Ground Water (a)	Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil	
Contaminant		CAS		µg/L	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
p-Nitrotoluene	N	99990	☒	6 RBM	0.6	CALA	0.6	CALA	0.6	CALA	0.6	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
NuStar	N	85509199		3 RBM	0.3	PQL	0.3	PQL	0.3	PQL	0.3	PQL	6	RBM	6	RBM	140	RBM	140	RBM
Oryzalin	N	19044883		180 RBM	18	CALA	18	CALA	18	CALA	18	CALA	390	RBM	390	RBM	5000	MAX	5000	MAX
Oxadiazon	N	19666309		18 RBM	15	CALB	15	CALB	15	CALB	15	CALB	39	RBM	39	RBM	1000	RBM	1000	RBM
Oxamyl	N	23135220		200 /91 MCL	20	CALA	20	CALA	20	CALA	20	CALA	200	RBM	200	RBM	5000	MAX	5000	MAX
Oxyfluorfen	N	42874033		11 RBM	1	CALA	1	CALA	1	CALA	1	CALA	23	RBM	23	RBM	610	RBM	610	RBM
Paraquat	N	1910425		16 RBM	2	CALA	2	CALA	2	CALA	2	CALA	35	RBM	35	RBM	920	RBM	920	RBM
Parathion	N	56382		22 RBM	13	CALB	13	CALB	13	CALB	13	CALB	47	RBM	47	RBM	1200	RBM	1200	RBM
Pentachlorobenzene	N	608935		3 RBM	4	CALB	4	CALB	4	CALB	4	CALB	6	RBM	6	RBM	160	RBM	160	RBM
Pentachloronitrobenzene	C	82688		0.3 RBC	3	RBC	3	RBC	22	CALB	22	CALB	3	RBC	3	RBC	22	RBC	22	RBC
Pentachlorophenol	C	87865		1 /0.6 MCL	5	RBC	5	CALB	5	CALB	5	CALB	5	RBC	5	RBC	48	RBC	48	RBC
Permethrin	N	52645531		180 RBM	18	CALA	18	CALA	18	CALA	18	CALA	390	RBM	390	RBM	5000	MAX	5000	MAX
Petroleum Hydrocarbons																				
C5 through C8 Aliphatic Hydrocarbons		n/a		400 MAG	100	MAG	100	MAG	100	MAG	100	MAG	100	MAG	100	MAG	500	MAG	500	MAG
C9 through C12 Aliphatic Hydrocarbons		n/a		4000 MAG	1000	MAG	1000	MAG	1000	MAG	1000	MAG	1000	MAG	1000	MAG	2500	MAG	2500	MAG
C9 through C18 Aliphatic Hydrocarbons		n/a		4000 MAG	1000	MAG	1000	MAG	1000	MAG	1000	MAG	1000	MAG	1000	MAG	2500	MAG	2500	MAG
C19 through C36 Aliphatic Hydrocarbons		n/a		5000 MAG	2500	MAG	2500	MAG	2500	MAG	2500	MAG	2500	MAG	2500	MAG	5000	MAG	5000	MAG
C9 through C10 Aromatic Hydrocarbons		n/a		200 MAG	100	MAG	100	MAG	100	MAG	100	MAG	100	MAG	100	MAG	500	MAG	500	MAG
C11 through C22 Aromatic Hydrocarbons		n/a		200 MAG	200	MAG	200	MAG	200	MAG	200	MAG	800	MAG	800	MAG	2000	MAG	2000	MAG
Phenol	N	108952		4000 HAL	400	CALA	400	CALA	400	CALA	400	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
m-Phenylenediamine	N	108452		22 RBM	2	CALA	2	CALA	2	CALA	2	CALA	47	RBM	47	RBM	1200	RBM	1200	RBM
o-Phenylenediamine	C	95545		1 RBC	0.1	PQL	0.1	PQL	0.1	PQL	0.1	PQL	14	RBC	14	RBC	120	RBC	120	RBC
p-Phenylenediamine	N	106503		690 RBM	69	CALA	69	CALA	69	CALA	69	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
2-Phenylphenol	C	90437		35 RBC	4	CALA	4	CALA	4	CALA	4	CALA	340	RBC	330	RBC	3000	RBC	3000	RBC
Phosphine	N	7803512		1 RBM	0.1	PQL	0.1	PQL	0.1	PQL	0.1	PQL	2	RBM	2	RBM	61	RBM	61	RBM
Phosphorus (white)	N	7723140		0.07 PQL	0.01	PQL	0.01	PQL	0.01	PQL	0.01	PQL	0.2	PQL	0.2	PQL	4	RBM	4	RBM
p-Phthalic acid	N	100210		3700 RBM	370	CALA	370	CALA	370	CALA	370	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Phthalic anhydride	N	85449		7300 RBM	730	CALB	730	CALB	730	CALB	730	CALB	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Picloram	N	1918021		500 MCL	50	CALA	50	CALA	50	CALA	50	CALA	550	RBM	550	RBM	5000	MAX	5000	MAX
Polybrominated biphenyls	C	0		0.008 PQL	8.E-04	PQL	8.E-04	PQL	8.E-04	PQL	8.E-04	PQL	0.07	PQL	0.07	PQL	0.6	RBC	0.6	RBC
Polychlorinated biphenyls (PCBs)	C	1336363		0.5 / 0.03 MCL	1	EPA	1	EPA	1	EPA	1	EPA	1	EPA	1	EPA	1	EPA	1	EPA
Aroclor 1016	C	12674112		0.10 RBC	5	RBC	5	RBC	18	CALB	18	CALB	5	RBC	5	RBC	82	RBC	82	RBC

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			V	Ground Water (a)	Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil	
Contaminant		CAS	O C	µg/L	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Aroclor 1221	C	11104282		0.03 PQL	0.3	PQL	0.3	PQL	0.5	CALB	0.5	CALB	0.3	PQL	0.3	PQL	3	RBC	3	RBC
Aroclor 1232	C	11141165		0.03 PQL	0.3	PQL	0.3	PQL	0.5	CALB	0.5	CALB	0.3	PQL	0.3	PQL	3	RBC	3	RBC
Aroclor 1242	C	53469219		0.03 PQL	0.3	PQL	0.3	PQL	3	RBC	3	RBC	0.3	PQL	0.3	PQL	3	RBC	3	RBC
Aroclor 1248	C	12672296		0.03 PQL	0.3	PQL	0.3	PQL	3	RBC	3	RBC	0.3	PQL	0.3	PQL	3	RBC	3	RBC
Aroclor 1254	C	11097691		0.03 PQL	0.3	PQL	0.3	PQL	3	RBC	3	RBC	0.3	PQL	0.3	PQL	3	RBC	3	RBC
Aroclor 1260	C	11096825		0.03 PQL	0.3	RBC	0.3	PQL	3	RBC	3	RBC	0.3	PQL	0.3	PQL	3	RBC	3	RBC
Polychlorinated terphenyls (PCTs)	C	61788338		0.02 PQL	0.002	PQL	0.002	PQL	0.002	PQL	0.002	PQL	0.1	PQL	0.1	PQL	1	RBC	1	RBC
Polynuclear aromatic hydrocarbons																				
Acenaphthene	N	83329	☒	37 RBM	270	CALB	270	CALB	270	CALB	270	CALB	470	RBM	470	RBM	5000	MAX	5000	MAX
Anthracene	N	120127	☒	180 RBM	1000	MAX	1000	MAX	5000	MAX	5000	MAX	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Benzo[a]anthracene	C	56553		0.09 PQL	0.9	RBC	0.9	RBC	8	RBC	8	RBC	0.9	RBC	0.9	RBC	8	RBC	8	RBC
Benzo[b]fluoranthene	C	205992		0.09 PQL	0.9	RBC	0.9	RBC	8	RBC	8	RBC	0.9	RBC	0.9	RBC	8	RBC	8	RBC
Benzo[k]fluoranthene	C	207089		0.9 RBC	9	RBC	9	RBC	78	RBC	78	RBC	9	RBC	9	RBC	78	RBC	78	RBC
Benzo[a]pyrene	C	50328		0.2 /0.01 MCL	0.09	PQL	0.09	PQL	0.8	RBC	0.8	RBC	0.09	PQL	0.09	PQL	0.8	RBC	0.8	RBC
Carbazole	C	86748		3 RBC	0.3	PQL	0.3	PQL	0.3	PQL	0.3	PQL	32	RBC	32	RBC	290	RBC	290	RBC
Chrysene	C	218019		9 RBC	87	RBC	87	RBC	780	RBC	780	RBC	87	RBC	87	RBC	780	RBC	780	RBC
Dibenz[ah]anthracene	C	53703		0.01 PQL	0.09	PQL	0.09	PQL	0.8	RBC	0.8	RBC	0.09	PQL	0.09	PQL	0.8	RBC	0.8	RBC
Fluoranthene	N	206440		150 RBM	310	RBM	310	RBM	1800	CALB	1800	CALB	310	RBM	310	RBM	5000	MAX	5000	MAX
Fluorene	N	86737	☒	24 RBM	300	CALB	300	CALB	300	CALB	300	CALB	310	RBM	310	RBM	5000	MAX	5000	MAX
Indeno[1,2,3-cd]pyrene	C	193395		0.09 PQL	0.9	RBC	0.9	RBC	8	RBC	8	RBC	0.9	RBC	0.9	RBC	8	RBC	8	RBC
2-Methylnaphthalene	N	91576	☒	12 RBM	1	CALA	1	CALA	1	CALA	1	CALA	160	RBM	160	RBM	4100	RBM	4100	RBM
Naphthalene	N	91203	☒	20 /0.7 HAL	5	CALB	5	CALB	5	CALB	5	CALB	160	RBM	160	RBM	4100	RBM	4100	RBM
Phenanthrene	N	85018		120 PAG	1000	MAX	1000	MAX	5000	MAX	5000	MAX	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Pyrene	N	129000	☒	18 RBM	230	RBM	230	RBM	1700	CALB	1700	CALB	230	RBM	230	RBM	5000	MAX	5000	MAX
N-Propylbenzene	N		☒	6 RBM	0.6	CALA	0.6	CALA	0.6	CALA	0.6	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
Prometon	N	1610180		55 RBM	6	CALA	6	CALA	6	CALA	6	CALA	120	RBM	120	RBM	3100	RBM	3100	RBM
Prometryn	N	7287196		15 RBM	2	CALA	2	CALA	2	CALA	2	CALA	31	RBM	31	RBM	820	RBM	820	RBM
Propachlor	N	1918167		47 RBM	5	CALA	5	CALA	5	CALA	5	CALA	100	RBM	100	RBM	2700	RBM	2700	RBM
Propanil	N	709988		18 RBM	2	CALA	2	CALA	2	CALA	2	CALA	39	RBM	39	RBM	1000	RBM	1000	RBM
Propargite	N	2312358		73 RBM	7	CALA	7	CALA	7	CALA	7	CALA	160	RBM	160	RBM	4100	RBM	4100	RBM
Propylene glycol	N	57556		73000 RBM	1000	MAX	1000	MAX	5000	MAX	5000	MAX	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Propylene glycol, monoethyl ether	N	52125538		2600 RBM	260	CALA	260	CALA	260	CALA	260	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX

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Contaminant		CAS	VOC	Ground Water (a) µg/L	Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg	Surface Soil mg/kg	Subsurface Soil mg/kg
Propylene glycol, monomethyl ether	N	107982		2600 RBM	260 CALA		260 CALA		260 CALA		260 CALA		1000 MAX		1000 MAX	5000 MAX	5000 MAX
Pursuit	N	81335775		910 RBM	91 CALA		91 CALA		91 CALA		91 CALA		1000 MAX		1000 MAX	5000 MAX	5000 MAX
Pyridine	N	110861		4 RBM	0.4 PQL		0.4 PQL		0.4 PQL		0.4 PQL		8 RBM		8 RBM	200 RBM	200 RBM
Quinoline	C	91225		0.06 PQL	0.006 PQL		0.006 PQL		0.006 PQL		0.006 PQL		0.05 PQL		0.05 PQL	0.5 RBC	0.5 RBC
RDX	C	121824		0.6 RBC	0.06 PQL		0.06 PQL		0.06 PQL		0.06 PQL		6 RBC		6 RBC	52 RBC	52 RBC
Resmethrin	N	10463868		110 RBM	11 CALA		11 CALA		11 CALA		11 CALA		230 RBM		230 RBM	5000 MAX	5000 MAX
Ronnel	N	299843		180 RBM	18 CALA		18 CALA		18 CALA		18 CALA		390 RBM		390 RBM	5000 MAX	5000 MAX
Rotenone	N	83794		15 RBM	2 CALA		2 CALA		2 CALA		2 CALA		31 RBM		31 RBM	820 RBM	820 RBM
Selenious Acid	N	7783008		18 RBM	2 CALA		2 CALA		2 CALA		2 CALA		39 RBM		39 RBM	1000 RBM	1000 RBM
Selenium	N	7782492		50 MCL	26 CALB		26 CALB		26 CALB		26 CALB		39 RBM		39 RBM	1000 RBM	1000 RBM
Silver and compounds	N	7440224		100 HAL	39 RBM		39 RBM		84 CALB		84 CALB		39 RBM		39 RBM	1000 RBM	1000 RBM
Simazine	C	122349		4 /0.6 MCL	0.4 PQL		0.4 PQL		0.4 PQL		0.4 PQL		5 RBC		5 RBC	48 RBC	48 RBC
Sodium azide	N	26628228		15 RBM	2 CALA		2 CALA		2 CALA		2 CALA		31 RBM		31 RBM	820 RBM	820 RBM
Sodium diethyldithiocarbamate	C	148185		0.3 RBC	0.03 PQL		0.03 PQL		0.03 PQL		0.03 PQL		2 RBC		2 RBC	21 RBC	21 RBC
Strontium, stable	N	7440246		2200 RBM	220 CALA		220 CALA		220 CALA		220 CALA		4700 RBM		4700 RBM	120000 RBM	120000 RBM
Strychnine	N	57249		1 RBM	0.1 PQL		0.1 PQL		0.1 PQL		0.1 PQL		2 RBM		2 RBM	61 RBM	61 RBM
Styrene	N	100425	☒	100 MCL	24 CALB		24 CALB		24 CALB		24 CALB		1000 MAX		1000 MAX	5000 MAX	5000 MAX
2,3,7,8-TCDD (dioxin)	C	1746016		3.E-05 MCL	4.E-06 PQL		4.E-06 PQL		4.E-05 PQL		4.E-05 PQL		4.E-06 PQL		4.E-06 PQL	4.E-05 PQL	4.E-05 PQL
1,2,4,5-Tetrachlorobenzene	N	95943	☒	1 RBM	0.1 PQL		0.1 PQL		0.1 PQL		0.1 PQL		2 RBM		2 RBM	61 RBM	61 RBM
1,1,1,2-Tetrachloroethane	C	630206	☒	4 RBC	0.4 PQL		0.4 PQL		0.4 PQL		0.4 PQL		25 RBC		25 RBC	220 RBC	220 RBC
1,1,2,2-Tetrachloroethane	C	79345	☒	0.05 PQL	0.2 PQL		0.2 PQL		0.2 PQL		0.2 PQL		0.6 SSLI		0.6 SSLI	29 RBC	29 RBC
Tetrachloroethylene (PCE)	C	127184	☒	5 /1 MCL	0.5 CALA		0.5 CALA		0.5 CALA		0.5 CALA		11 SSLI		11 SSLI	110 RBC	110 RBC
2,3,4,6-Tetrachlorophenol	N	58902		110 RBM	170 CALB		170 CALB		170 CALB		170 CALB		230 RBM		230 RBM	5000 MAX	5000 MAX
p,a,a,a-Tetrachlorotoluene	C	5216251	☒	0.003 PQL	3.E-04 PQL		3.E-04 PQL		3.E-04 PQL		3.E-04 PQL		0.03 PQL		0.03 PQL	0.3 PQL	0.3 PQL
Tetraethyl lead	N	78002		4.E-04 PQL	4.E-05 PQL		4.E-05 PQL		4.E-05 PQL		4.E-05 PQL		8.E-04 PQL		8.E-04 PQL	0.02 PQL	0.02 PQL
Tetrahydrofuran	C	109999		9 RBC	0.9 CALA		0.9 CALA		0.9 CALA		0.9 CALA		84 RBC		84 RBC	750 RBC	750 RBC
Tetryl	N	479458		37 RBM	4 CALA		4 CALA		4 CALA		4 CALA		78 RBM		78 RBM	2000 RBM	2000 RBM
Thallic oxide	N	1314325		0.3 RBM	0.03 PQL		0.03 PQL		0.03 PQL		0.03 PQL		1 RBM		1 RBM	14 RBM	14 RBM
Thallium	N	7440280		2 MCL	14 CALB		14 CALB		14 CALB		14 CALB		18 PAG		18 PAG	220 PAG	220 PAG
Thallium acetate	N	563688		0.3 RBM	0.03 PQL		0.03 PQL		0.03 PQL		0.03 PQL		0.7 RBM		0.7 RBM	18 RBM	18 RBM
Thallium carbonate	N	6533739		0.3 RBM	0.03 PQL		0.03 PQL		0.03 PQL		0.03 PQL		0.6 RBM		0.6 RBM	16 RBM	16 RBM
Thallium chloride	N	7791120		0.3 RBM	0.03 PQL		0.03 PQL		0.03 PQL		0.03 PQL		0.6 RBM		0.6 RBM	16 RBM	16 RBM

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Contaminant		CAS	VOC	Ground Water (a) µg/L	Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg		Surface Soil mg/kg		Subsurface Soil mg/kg	
Thallium nitrate	N	10102451		0.3 RBM	0.03	PQL	0.03	PQL	0.03	PQL	0.03	PQL	0.7	RBM	0.7	RBM	18	RBM	18	RBM
Thallium sulfate	N	7446186		0.3 RBM	0.03	PQL	0.03	PQL	0.03	PQL	0.03	PQL	0.6	RBM	0.6	RBM	16	RBM	16	RBM
Thiobencarb	N	28249776		37 RBM	4	CALA	4	CALA	4	CALA	4	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
Tin and compounds	N	7440315		2200 RBM	220	CALA	220	CALA	220	CALA	220	CALA	4700	RBM	4700	RBM	120000	RBM	120000	RBM
Titanium	N	7440326		15000 RBM	1500	CALA	1500	CALA	1500	CALA	1500	CALA	31000	RBM	31000	RBM	820000	RBM	820000	RBM
Titanium Dioxide	N	13463677		15000 RBM	1500	CALA	1500	CALA	1500	CALA	1500	CALA	31000	RBM	31000	RBM	820000	RBM	820000	RBM
Toluene	N	108883	☒	1000 /750 MCL	100	CALA	100	CALA	100	CALA	100	CALA	650	SSLI	650	SSLI	5000	MAX	5000	MAX
Toluene-2,4-diamine	C	95807		0.02 PQL	0.002	PQL	0.002	PQL	0.002	PQL	0.002	PQL	0.2	PQL	0.2	PQL	2	RBC	2	RBC
Toluene-2,5-diamine	N	95705		2200 RBM	220	CALA	220	CALA	220	CALA	220	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
Toluene-2,6-diamine	N	823405		730 RBM	73	CALA	73	CALA	73	CALA	73	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
p-Toluidine	C	106490		0.4 RBC	0.04	PQL	0.04	PQL	0.04	PQL	0.04	PQL	3	RBC	3	RBC	30	RBC	30	RBC
Toxaphene	C	8001352		3 /0.06 MCL	0.6	RBC	0.6	RBC	1	CALB	1	CALB	0.6	RBC	0.6	RBC	5	RBC	5	RBC
1,2,4-Tribromobenzene	N	615543	☒	18 RBM	2	CALA	2	CALA	2	CALA	2	CALA	39	RBM	39	RBM	1000	RBM	1000	RBM
Tributyltin oxide (TBTO)	N	56359		1 RBM	0.1	PQL	0.1	PQL	0.1	PQL	0.1	PQL	2	RBM	2	RBM	61	RBM	61	RBM
2,4,6-Trichloroaniline	C	634935		2 RBC	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	19	RBC	19	RBC	170	RBC	170	RBC
1,2,4-Trichlorobenzene	N	120821	☒	70 MCL	28	CALB	28	CALB	28	CALB	28	CALB	78	RBM	78	RBM	2000	RBM	2000	RBM
1,1,1-Trichloroethane	N	71556	☒	200 MCL	20	CALA	20	CALA	20	CALA	20	CALA	160	RBM	160	RBM	4100	RBM	4100	RBM
1,1,2-Trichloroethane	C	79005	☒	5 /0.2 MCL	0.5	CALA	0.5	CALA	0.5	CALA	0.5	CALA	1	SSLI	1	SSLI	100	RBC	100	RBC
Trichloroethylene (TCE)	C	79016	☒	5 /2 MCL	0.5	CALA	0.5	CALA	0.5	CALA	0.5	CALA	5	SSLI	5	SSLI	520	RBC	520	RBC
Trichlorofluoromethane	N	75694	☒	2000 /1300 HAL	200	CALA	200	CALA	200	CALA	200	CALA	1000	MAX	1000	MAX	5000	MAX	5000	MAX
2,4,5-Trichlorophenol	N	95954		370 RBM	220	CALB	220	CALB	220	CALB	220	CALB	780	RBM	780	RBM	5000	MAX	5000	MAX
2,4,6-Trichlorophenol	C	88062		6 RBC	2	CALB	2	CALB	2	CALB	2	CALB	58	RBC	58	RBC	520	RBC	520	RBC
2,4,5-Trichlorophenoxyacetic acid	N	93765		70 HAL	7	CALA	7	CALA	7	CALA	7	CALA	78	RBM	78	RBM	2000	RBM	2000	RBM
2-(2,4,5-Trichlorophenoxy)propionic acid	N	93721		50 MCL	22	CALB	22	CALB	22	CALB	22	CALB	63	RBM	63	RBM	1600	RBM	1600	RBM
1,1,2-Trichloropropane	N	598776	☒	40 /30 HAL	4	CALA	4	CALA	4	CALA	4	CALA	39	RBM	39	RBM	1000	RBM	1000	RBM
1,2,3-Trichloropropane	C	96184	☒	0.002 PQL	2.E-04	PQL	2.E-04	PQL	2.E-04	PQL	2.E-04	PQL	0.09	PQL	0.09	PQL	0.8	RBC	0.8	RBC
1,2,3-Trichloropropene	N	96195	☒	3 RBM	0.3	PQL	0.3	PQL	0.3	PQL	0.3	PQL	39	RBM	39	RBM	1000	RBM	1000	RBM
1,1,2-Trichloro-1,2,2- trifluoroethane	N	76131	☒	5900 RBM	640	CALB	640	CALB	640	CALB	640	CALB	1000	MAX	1000	MAX	5000	MAX	5000	MAX
1,2,4-Trimethylbenzene	N	95636	☒	1 RBM	0.1	PQL	0.1	PQL	0.1	PQL	0.1	PQL	390	RBM	390	RBM	5000	MAX	5000	MAX
1,3,5-Trimethylbenzene	N	108678	☒	1 RBM	0.1	PQL	0.1	PQL	0.1	PQL	0.1	PQL	390	RBM	390	RBM	5000	MAX	5000	MAX
Trimethyl phosphate	C	512561		2 RBC	0.2	PQL	0.2	PQL	0.2	PQL	0.2	PQL	17	RBC	17	RBC	150	RBC	150	RBC
1,3,5-Trinitrobenzene	N	99354		110 RBM	11	CALA	11	CALA	11	CALA	11	CALA	230	RBM	230	RBM	5000	MAX	5000	MAX

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			O	Ground Water (a)	Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil		Unrestricted Use				Restricted Use		
													Surface Soil		Subsurface Soil		Surface Soil		Subsurface Soil	
Contaminant		CAS	C	µg/L	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
2,4,6-Trinitrotoluene	C	118967		2 RBC	0.2 PQL		0.2 PQL		0.2 PQL		0.2 PQL		21 RBC		21 RBC		190 RBC		190 RBC	
Uranium (soluble salts)	N	7440611		11 RBM	1 CALA		1 CALA		1 CALA		1 CALA		23 RBM		23 RBM		610 RBM		610 RBM	
Vanadium	N	7440622		26 RBM	55 RBM		55 RBM		1400 RBM		1400 RBM		55 RBM		55 RBM		1400 RBM		1400 RBM	
Vanadium pentoxide	N	1314621		33 RBM	3 CALA		3 CALA		3 CALA		3 CALA		70 RBM		70 RBM		1800 RBM		1800 RBM	
Vanadium sulfate	N	36907423		73 RBM	7 CALA		7 CALA		7 CALA		7 CALA		160 RBM		160 RBM		4100 RBM		4100 RBM	
Vinclozolin	N	50471448		91 RBM	9 CALA		9 CALA		9 CALA		9 CALA		200 RBM		200 RBM		5000 MAX		5000 MAX	
Vinyl acetate	N	108054	☒	41 RBM	4 CALA		4 CALA		4 CALA		4 CALA		1000 MAX		1000 MAX		5000 MAX		5000 MAX	
Vinyl chloride	C	75014	☒	2 /0.02 MCL	0.03 SSLI		0.03 PQL		0.2 PQL		0.2 PQL		0.03 SSLI		0.03 PQL		3 RBC		3 RBC	
Warfarin	N	81812		1 RBM	0.3 PQL		0.3 PQL		0.3 PQL		0.3 PQL		2 RBM		2 RBM		61 RBM		61 RBM	
m-Xylene	N	108323	☒	1200 RBM	420 SSLI		420 SSLI		420 SSLI		420 SSLI		420 SSLI		420 SSLI		5000 MAX		5000 MAX	
o-Xylene	N	95476	☒	1200 RBM	410 SSLI		410 SSLI		410 SSLI		410 SSLI		410 SSLI		410 SSLI		5000 MAX		5000 MAX	
p-Xylene	N	106423	☒	1200 RBM	460 SSLI		460 SSLI		460 SSLI		460 SSLI		460 SSLI		460 SSLI		5000 MAX		5000 MAX	
Xylene (mixed)	N	1330207	☒	10000 /1200 MCL	420 SSLI		420 SSLI		420 SSLI		420 SSLI		420 SSLI		420 SSLI		5000 MAX		5000 MAX	
Zinc and compounds	N	7440666		2000 HAL	2300 RBM		2300 RBM		2300 RBM		2300 RBM		2300 RBM		2300 RBM		61000 RBM		61000 RBM	
Zinc phosphide	N	1314847		1 RBM	0.1 PQL		0.1 PQL		0.1 PQL		0.1 PQL		2 RBM		2 RBM		61 RBM		61 RBM	
Zineb	N	12122677		180 RBM	18 CALA		18 CALA		18 CALA		18 CALA		390 RBM		390 RBM		5000 MAX		5000 MAX	

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EPAR - EPA National Recommended Water Quality Criteria, December 1998
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			VOC	Surface Water		Sediment		Surface Soil	
Contaminant		CAS		µg/L		mg/kg		mg/kg	
Acetaldehyde	N	75070			NDA		NDA		NDA
Acetochlor	N	34256821			NDA		NDA		NDA
Acetone	N	67641		1500	ORNL	0.01	ORNL		NDA
Acetonitrile	N	75078			NDA		NDA		NDA
Acetophenone	N	98862	☒		NDA		NDA		NDA
Acrolein	N	107028		320	EPAR		NDA		NDA
Acrylamide	C	79061			NDA		NDA		NDA
Acrylonitrile	C	107131	☒	0.06	EPAR		NDA	1000	ORNL
Alachlor	C	15972608			NDA		NDA		NDA
Alar	N	1596845			NDA		NDA		NDA
Aldicarb	N	116063			NDA		NDA		NDA
Aldicarb sulfone	N	1646884			NDA		NDA		NDA
Aldrin	C	309002		3	DWQ	0.08	ORNL		NDA
Aluminum	N	7429905		87	ORNL		NDA		NDA
Aminodinitotoluenes	N				NDA		NDA		NDA
4-Aminopyridine	N	504245			NDA		NDA		NDA
Aniline	N	62533			NDA		NDA		NDA
Antimony and compounds	N	7440360		30	ORNL	2	ORNL	5	ORNL
Antimony pentoxide	N	1314609			NDA		NDA		NDA
Antimony tetroxide	N	1332316			NDA		NDA		NDA
Antimony trioxide	N	1309644			NDA		NDA		NDA
Arsenic	N	7440382		3	ORNL	8	ECTX	10	ORNL
Assure	N	76578148			NDA		NDA		NDA
Atrazine	C	1912249			NDA		NDA		NDA
Azobenzene	C	103333			NDA		NDA		NDA
Barium and compounds	N	7440393		4	ORNL	20	ORNL	283	ORNL
Baygon	N	114261			NDA		NDA		NDA
Baythroid	N	68359375			NDA		NDA		NDA
Bentazon	N	25057890			NDA		NDA		NDA
Benzaldehyde	N	100527	☒		NDA		NDA		NDA
Benzene	C	71432	☒	1	EPAR	0.06	ECTX		NDA
Benzenethiol	N	108985			NDA		NDA		NDA
Benzidine	C	92875		1.E-04	EPAR	0.002	ORNL		NDA
Benzoic acid	N	65850		42	ORNL	0.7	ORNL		NDA
Benzyl alcohol	N	100516		9	ORNL	0.001	ORNL		NDA
Benzyl chloride	C	100447	☒		NDA		NDA		NDA
Beryllium and compounds	C	7440417		0.7	ORNL		NDA	10	ORNL
1,1-Biphenyl	N	92524		14	ECTX	1	ECTX	60	ORNL
Bis(2-chloroethyl)ether	C	111444	☒	0.03	EPAR		NDA		NDA
Bis(2-chloroisopropyl)ether	C	39638329	☒	1400	EPAR		NDA		NDA
Bis(chloromethyl)ether	C	542881	☒		NDA		NDA		NDA
Bis(2-ethylhexyl)phthalate (DEHP)	C	117817		0.1	ORNL	3	ORNL		NDA
Boron (and borates)	N	7440428		2	ORNL		NDA	0.5	ORNL
Bromodichloromethane	C	75274	☒		NDA		NDA		NDA
Bromoform (tribromomethane)	C	75252	☒	4	EPAR		NDA		NDA
Bromomethane	C	74839	☒	48	EPAR		NDA		NDA
Bromophos	N	2104963			NDA		NDA		NDA
1-Butanol	N	71363			NDA		NDA		NDA
N-Butylbenzene	N	104518	☒		NDA		NDA		NDA
Butyl benzyl phthalate	N	85687		19	ECTX	11	ECTX		NDA
Butylate	N	2008415			NDA		NDA		NDA
sec-Butylbenzene	N	135988	☒		NDA		NDA		NDA
tert-Butylbenzene	N	104518	☒		NDA		NDA		NDA
Cadmium and compounds	N	7440439		1.0	ORNL	1	ECTX	3	ORNL

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Contaminant		CAS		µg/L		mg/kg		mg/kg	
Caprolactam	N	105602			NDA		NDA		NDA
Carbaryl	N	63252			NDA		NDA		NDA
Carbon disulfide	N	75150	☒	0.9	ORNL	9.E-04	ORNL		NDA
Carbon tetrachloride	C	56235	☒	0.3	EPAR	1	ORNL	1000	ORNL
Carbosulfan	N	55285148			NDA		NDA		NDA
Chloral	N	75876			NDA		NDA		NDA
Chloranil	C	118752			NDA		NDA		NDA
Chlordane	C	57749		0.004	EPAR	0.005	ORNL		NDA
Chlorine	N	7782505			NDA		NDA		NDA
Chloroacetic acid	N	79118			NDA		NDA		NDA
4-Chloroaniline	N	106478			NDA		NDA	30	ORNL
Chlorobenzene	N	108907	☒	64	ORNL	0.4	ORNL	40	ORNL
Chlorobenzilate	C	510156			NDA		NDA		NDA
p-Chlorobenzoic acid	N	74113			NDA		NDA		NDA
2-Chloro-1,3-butadiene	N	126998	☒		NDA		NDA		NDA
1-Chlorobutane	N	109693	☒		NDA		NDA		NDA
Chloroethane	C	75003	☒		NDA		NDA		NDA
Chloroform	C	67663	☒	6	EPAR	0.18	ORNL		NDA
Chloromethane	C	74873	☒		NDA		NDA		NDA
4-Chloro-2-methylaniline	C	95692			NDA		NDA		NDA
beta-Chloronaphthalene	N	91587		1700	EPAR		NDA		NDA
o-Chloronitrobenzene	C	88733	☒		NDA		NDA		NDA
p-Chloronitrobenzene	C	100005	☒		NDA		NDA		NDA
2-Chlorophenol	N	95578		120	EPAR		NDA	10	ORNL
o-Chlorotoluene	N	95498	☒		NDA		NDA		NDA
Chlorpyrifos	N	2921882			NDA		NDA		NDA
Chlorpyrifos-methyl	N	5598130			NDA		NDA		NDA
Chromium III and compounds	N	16065831		210	ORNL	81	ECTX	0.4	ORNL
Chromium VI and compounds	N	18540299		11	ORNL		NDA		NDA
Cobalt	N	7440484		23	ORNL		NDA	20	ORNL
Copper and compounds	N	7440508		12	ORNL	34	ECTX	50	ORNL
Crotonaldehyde	C	123739			NDA		NDA		NDA
Cumene	N	98828			NDA		NDA		NDA
Cyanides:				5	ORNL				
Calcium cyanide	N	592018			NDA		NDA		NDA
Copper cyanide	N	544923			NDA		NDA		NDA
Cyanazine	C	21725462			NDA		NDA		NDA
Cyanogen	N	460195			NDA		NDA		NDA
Cyanogen bromide	N	506683			NDA		NDA		NDA
Cyanogen chloride	N	506774			NDA		NDA		NDA
Free cyanide	N	57125		22	DWQ	0.1	ORNL		NDA
Hydrogen cyanide	N	74908			NDA		NDA		NDA
Potassium cyanide	N	151508			NDA		NDA		NDA
Potassium silver cyanide	N	506616			NDA		NDA		NDA
Silver cyanide	N	506649			NDA		NDA		NDA
Sodium cyanide	N	143339			NDA		NDA		NDA
Thiocyanate	N	0			NDA		NDA		NDA
Zinc cyanide	N	557211			NDA		NDA		NDA
Cyclohexanone	N	108941	☒		NDA		NDA		NDA
Cyhalothrin/Karate	N	68085858			NDA		NDA		NDA
Cypermethrin	N	52315078			NDA		NDA		NDA
Dacthal	N	1861321			NDA		NDA		NDA
Dalapon	N	75990			NDA		NDA		NDA
DDD	C	72548		4.E-05	ORNL	0.008	ORNL		NDA
DDE	C	72559			NDA	0.03	ORNL		NDA

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Contaminant		CAS	VOC	µg/L		mg/kg		mg/kg	
DDT	C	50293		4.E-05	ORNL	0.002	ECTX		NDA
Diazinon	N	333415		0.04	ORNL	0.002	ECTX		NDA
Dibenzofuran	N	132649		4	ORNL	0.4	ORNL		NDA
1,4-Dibromobenzene	N	106376	☒		NDA		NDA		NDA
Dibromochloromethane	C	124481	☒		NDA		NDA		NDA
1,2-Dibromo-3-chloropropane	C	96128	☒		NDA		NDA		NDA
1,2-Dibromoethane	C	106934	☒		NDA		NDA		NDA
Dibutyl phthalate	N	84742		33	ECTX	11	ECTX	200	ORNL
Dicamba	N	1918009			NDA		NDA		NDA
1,2-Dichlorobenzene	N	95501	☒	14	ECTX	0.3	ECTX		NDA
1,3-Dichlorobenzene	N	541731	☒	71	ECTX	1.7	ECTX		NDA
1,4-Dichlorobenzene	C	106467	☒	15	ECTX	0.4	ECTX	20	ORNL
3,3'-Dichlorobenzidine	C	91941		0.04	EPAR		NDA		NDA
Dichlorodifluoromethane (Freon 12)	N	75718	☒		NDA		NDA		NDA
1,1-Dichloroethane	N	75343	☒	47	ECTX	0.03	ORNL		NDA
1,2-Dichloroethane (EDC)	C	107062	☒	910	ORNL	0.3	ORNL		NDA
1,1-Dichloroethylene	C	75354	☒	25	ORNL	0.06	ORNL		NDA
1,2-Dichloroethylene (cis)	N	156592	☒	31	ORNL	0.02	ORNL		NDA
1,2-Dichloroethylene (trans)	N	156605	☒	31	ORNL	0.02	ORNL		NDA
1,2-Dichloroethylene (mixture)	N	540590	☒	590	ORNL		NDA		NDA
2,4-Dichlorophenol	N	120832		93	EPAR		NDA		NDA
2,4-Dichlorophenoxyacetic Acid (2,4-D)	N	94757	☒		NDA		NDA		NDA
4-(2,4-Dichlorophenoxy)butyric Acid	N	94826			NDA		NDA		NDA
1,2-Dichloropropane	C	78875	☒		NDA		NDA	700	ORNL
2,3-Dichloropropanol	N	616239			NDA		NDA		NDA
1,3-Dichloropropene	C	542756	☒	10	EPAR		NDA		NDA
Dichlorvos	C	62737			NDA		NDA		NDA
Dicofol	C	115322			NDA		NDA		NDA
Dicyclopentadiene	N	77736	☒		NDA		NDA		NDA
Dieldrin	C	60571		3	DWQ	0.004	ORNL		NDA
Diethyl phthalate	N	84662		210	ORNL	0.6	ECTX	100	ORNL
Diethylene glycol, monoethyl ether	N	111900			NDA		NDA		NDA
Di(2-ethylhexyl)adipate	C	103231			NDA		NDA		NDA
Diethylstilbestrol	C	56531			NDA		NDA		NDA
Difenzoquat (Avenge)	N	43222486			NDA		NDA		NDA
Diisopropyl methylphosphonate (DIMP)	N	1445756			NDA		NDA		NDA
3,3'-Dimethoxybenzidine	C	119904			NDA		NDA		NDA
2,4-Dimethylaniline hydrochloride	C	21436964			NDA		NDA		NDA
2,4-Dimethylaniline	C	95681			NDA		NDA		NDA
N-N-Dimethylaniline	N	121697			NDA		NDA		NDA
3,3'-Dimethylbenzidine	C	119937			NDA		NDA		NDA
1,1-Dimethylhydrazine	C	57147			NDA		NDA		NDA
1,2-Dimethylhydrazine	C	540738			NDA		NDA		NDA
2,4-Dimethylphenol	N	105679		540	EPAR	0.3	ORNL		NDA
2,6-Dimethylphenol	N	576261			NDA		NDA		NDA
3,4-Dimethylphenol	N	95658			NDA		NDA		NDA
Dimethyl phthalate	N	131113		313000	EPAR		NDA	200	ORNL
1,2-Dinitrobenzene	N	528290			NDA		NDA		NDA
1,3-Dinitrobenzene	N	99650			NDA		NDA		NDA
1,4-Dinitrobenzene	N	100254			NDA		NDA		NDA
4,6-Dinitro-o-cyclohexyl phenol	N	131895			NDA		NDA		NDA
2,4-Dinitrophenol	N	51285		70	EPAR		NDA	20	ORNL
Dinitrotoluene mix	C				NDA		NDA		NDA
2,4-Dinitrotoluene	N	121142		0.1	EPAR		NDA		NDA

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Contaminant		CAS	C	µg/L		mg/kg		mg/kg	
2,6-Dinitrotoluene	N	606202			NDA		NDA		NDA
Dinoseb	N	88857			NDA		NDA		NDA
di-n-Octyl phthalate	N	117840		708	ORNL	1000	MAX		NDA
1,4-Dioxane	C	123911			NDA		NDA		NDA
Diphenylamine	N	122394			NDA		NDA		NDA
1,2-Diphenylhydrazine	C	122667		0.04	EPAR		NDA		NDA
Diquat	N	85007			NDA		NDA		NDA
Disulfoton	N	298044			NDA		NDA		NDA
1,4-Dithiane	N	505293			NDA		NDA		NDA
Diuron	N	330541			NDA		NDA		NDA
Endosulfan	N	115297		0.05	ORNL	0.005	ECTX		NDA
Endothall	N	145733			NDA		NDA		NDA
Endrin	N	72208		0.06	ORNL	0.02	ECTX		NDA
Epichlorohydrin	C	106898			NDA		NDA		NDA
Ethion	N	563122			NDA		NDA		NDA
2-Ethoxyethanol	N	110805			NDA		NDA		NDA
Ethyl acetate	N	141786			NDA		NDA		NDA
Ethylbenzene	N	100414	☒	7	ORNL	4	ECTX		NDA
Ethylene diamine	N	107153			NDA		NDA		NDA
Ethylene glycol	N	107211			NDA		NDA		NDA
Ethylene oxide	C	75218			NDA		NDA		NDA
Ethylene thiourea (ETU)	C	96457			NDA		NDA		NDA
Ethyl ether	N	60297	☒		NDA		NDA		NDA
Ethyl methacrylate	N	97632			NDA		NDA		NDA
Fenamiphos	N	22224926			NDA		NDA		NDA
Fluometuron	N	2164172			NDA		NDA		NDA
Flourine	N	7782414						200	ORNL
Fomesafen	C	72178020			NDA		NDA		NDA
Fonofos	N	944229			NDA		NDA		NDA
Formaldehyde	N	50000			NDA		NDA		NDA
Formic Acid	N	64186			NDA		NDA		NDA
Furan	N	110009			NDA		NDA	600	ORNL
Furazolidone	C	67458			NDA		NDA		NDA
Furfural	N	98011			NDA		NDA		NDA
Glycidaldehyde	N	765344			NDA		NDA		NDA
Glyphosate	N	1071836			NDA		NDA		NDA
HCH (alpha)	C	319846		0.004	EPAR		NDA		NDA
HCH (beta)	C	319857		0.01	EPAR		NDA		NDA
HCH (gamma) Lindane	C	58899		2	DWQ	0.001	ORNL		NDA
HCH-technical	C	608731			NDA		NDA		NDA
Heptachlor	C	76448	☒	0.007	ORNL	0.005	ORNL		NDA
Heptachlor epoxide	C	1024573	☒	0.004	EPAR		NDA		NDA
Hexabromobenzene	N	87821	☒		NDA		NDA		NDA
Hexachlorobenzene	C	118741	☒	8.E-04	EPAR		NDA	1000	ORNL
Hexachlorobutadiene	C	87683	☒	0.4	EPAR		NDA		NDA
Hexachlorocyclopentadiene	N	77474	☒	240	EPAR		NDA	10	ORNL
Hexachlorodibenzo-p-dioxin mixture	C	19408743			NDA		NDA		NDA
Hexachloroethane	C	67721	☒	2	EPAR	1	ECTX		NDA
Hexachlorophene	N	70304			NDA		NDA		NDA
n-Hexane	N	110543	☒	0.6	ORNL	0.04	ORNL		NDA
2-Hexanone	N	591786		0.1	ORNL	0.02	ORNL		NDA
Hexazinone	N	51235042			NDA		NDA		NDA
HMX	N	2691410			NDA		NDA		NDA
Hydrazine	C	302012			NDA		NDA		NDA

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Hydrogen sulfide	N	7783064			NDA		NDA		NDA
Hydroquinone	N	123319			NDA		NDA		NDA
Iron	N	7439896		1000	ECTX		NDA		NDA
Isobutanol	N	78831	☒		NDA		NDA		NDA
Isophorone	C	78591		36	EPAR		NDA		NDA
Isopropalin	N	33820530			NDA		NDA		NDA
Isopropyl methyl phosphonic acid	N	1832548			NDA		NDA		NDA
Lead	N	7439921		3	ORNL	47	ORNL	41	ORNL
Lithium	N	7439932		14	ORNL		NDA	2	ORNL
Malathion	N	121755		0.10	ECTX	7.E-04	ECTX		NDA
Maleic anhydride	N	108316			NDA		NDA		NDA
Manganese and compounds	N	7439965		80	ECTX		NDA		NDA
Mephosfolan	N	950107			NDA		NDA		NDA
Mepiquat chloride	N	24307264			NDA		NDA		NDA
Mercuric chloride	N	7487947			NDA		NDA		NDA
Mercury (inorganic)	N	7439976		1	ORNL	0.2	ECTX	5.E-04	ORNL
Mercury (methyl)	N	22967926		0.003	ORNL		NDA		NDA
Methacrylonitrile	N	126987			NDA		NDA		NDA
Methanol	N	67561			NDA		NDA		NDA
Methidathion	N	950378			NDA		NDA		NDA
Methoxychlor	N	72435		0.02	ECTX	0.02	ECTX		NDA
Methyl acetate	N	79209			NDA		NDA		NDA
Methyl acrylate	N	96333			NDA		NDA		NDA
2-Methylaniline	C	95534			NDA		NDA		NDA
4-(2-Methyl-4-chlorophenoxy) butyric acid	N	94815			NDA		NDA		NDA
2-Methyl-4-chlorophenoxyacetic acid	N	94746			NDA		NDA		NDA
2-(2-Methyl-14-chlorophenoxy)propionic a	N	93652			NDA		NDA		NDA
Methylene bromide	N	74953	☒		NDA		NDA		NDA
Methylene chloride	C	75092	☒	5	EPAR	0.4	ORNL		NDA
4,4'-Methylene bis(2-chloroaniline	C	101144			NDA		NDA		NDA
4,4'-Methylene bis(N,N'-dimethyl)anilin	C	101611			NDA		NDA		NDA
Methyl ethyl ketone	N	78933	☒		NDA		NDA		NDA
Methyl hydrazine	C	60344			NDA		NDA		NDA
Methyl isobutyl ketone	N	108101			NDA		NDA		NDA
Methyl methacrylate	N	80626			NDA		NDA		NDA
2-Methyl-5-nitroaniline	C	99558			NDA		NDA		NDA
Methyl parathion	N	298000			NDA		NDA		NDA
2-Methylphenol (o-cresol)	N	95487		13	ORNL	0.01	ORNL		NDA
3-Methylphenol (m-cresol)	N	103394			NDA		NDA		NDA
4-Methylphenol (p-cresol)	N	106445			NDA		NDA		NDA
Methyl styrene (mixture)	N	25013154	☒		NDA		NDA		NDA
Methyl styrene (alpha)	N	98839	☒		NDA		NDA		NDA
Methyl tertbutyl ether (MTBE)	N	1634044	☒		NDA		NDA		NDA
Metolaclor (Dual)	N	51218452			NDA		NDA		NDA
Mirex	C	2385855			NDA	1	ORNL		NDA
Molybdenum	N	7439987		370	ORNL		NDA	2	ORNL
Monochloramine	N	10599903			NDA		NDA		NDA
Naled	N	300765			NDA		NDA		NDA
Nickel and compounds	N	7440020		160	ORNL	21	ECTX	30	ORNL
Nitrate	N	14797558			NDA		NDA		NDA
Nitric oxide	N	10102439			NDA		NDA		NDA
Nitrite	N	14797650			NDA		NDA		NDA
2-Nitroaniline	N	88744			NDA		NDA		NDA
Nitrobenzene	N	98953	☒	17	EPAR		NDA	40	ORNL

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				URS for Protection of the Environment					
			V						
			O	Surface Water		Sediment		Surface Soil	
Contaminant		CAS	C	µg/L		mg/kg		mg/kg	
Nitrofurantoin	N	67209			NDA		NDA		NDA
Nitrofurazone	C	59870			NDA		NDA		NDA
Nitrogen dioxide	N	10102440			NDA		NDA		NDA
Nitroglycerin	C	55630			NDA		NDA		NDA
4-Nitrophenol	N	100027		300	ORNL		NDA	7	ORNL
N-Nitrosodi-n-butylamine	C	924163			NDA		NDA		NDA
N-Nitrosodiethanolamine	C	1116547			NDA		NDA		NDA
N-Nitrosodiethylamine	C	55185			NDA		NDA		NDA
N-Nitrosodimethylamine	C	62759		7.E-04	EPAR		NDA		NDA
N-Nitrosodiphenylamine	C	86306		5	EPAR		NDA	20	ORNL
N-Nitroso di-n-propylamine	C	621647		0.005	EPAR		NDA		NDA
N-Nitroso-N-methylethylamine	C	10595956			NDA		NDA		NDA
N-Nitrosopyrrolidine	C	930552			NDA		NDA		NDA
m-Nitrotoluene	N	99081	☒		NDA		NDA		NDA
o-Nitrotoluene	N	88722	☒		NDA		NDA		NDA
p-Nitrotoluene	N	99990	☒		NDA		NDA		NDA
NuStar	N	85509199			NDA		NDA		NDA
Oryzalin	N	19044883			NDA		NDA		NDA
Oxadiazon	N	19666309			NDA		NDA		NDA
Oxamyl	N	23135220			NDA		NDA		NDA
Oxyfluorfen	N	42874033			NDA		NDA		NDA
Paraquat	N	1910425			NDA		NDA		NDA
Parathion	N	56382			NDA		NDA		NDA
Pentachlorobenzene	N	608935	☒	0.5	ECTX	0.7	ECTX	20	ORNL
Pentachloronitrobenzene	C	82688	☒		NDA		NDA		NDA
Pentachlorophenol	C	87865		20	DWQ	0.4	ORNL	3	ORNL
Permethrin	N	52645531			NDA		NDA		NDA
Petroleum Hydrocarbons									
C5 through C8 Aliphatic Hydrocarbons		n/a			NDA		NDA		NDA
C9 through C12 Aliphatic Hydrocarbons		n/a			NDA		NDA		NDA
C9 through C18 Aliphatic Hydrocarbons		n/a			NDA		NDA		NDA
C19 through C36 Aliphatic Hydrocarbons		n/a			NDA		NDA		NDA
C9 through C10 Aromatic Hydrocarbons		n/a			NDA		NDA		NDA
C11 through C22 Aromatic Hydrocarbons		n/a			NDA		NDA		NDA
Phenol	N	108952		110	ORNL	0.03	ORNL	30	ORNL
m-Phenylenediamine	N	108452			NDA		NDA		NDA
o-Phenylenediamine	C	95545			NDA		NDA		NDA
p-Phenylenediamine	N	106503			NDA		NDA		NDA
2-Phenylphenol	C	90437			NDA		NDA		NDA
Phosphine	N	7803512			NDA		NDA		NDA
Phosphorus (white)	N	7723140			NDA		NDA		NDA
p-Phthalic acid	N	100210			NDA		NDA		NDA
Phthalic anhydride	N	85449			NDA		NDA		NDA
Picloram	N	1918021			NDA		NDA		NDA
Polybrominated biphenyls	C	0			NDA		NDA		NDA
Polychlorinated biphenyls (PCBs)	C	1336363		0.002	ORNL	0.002	ECTX	40	ORNL
Aroclor 1016	N	12674112		0.2	ORNL	0.5	ORNL		NDA
Aroclor 1221	C	11104282		0.3	ORNL	0.1	ORNL		NDA
Aroclor 1232	C	11141165		0.6	ORNL	0.6	ORNL		NDA
Aroclor 1242	C	53469219		0.05	ORNL	29	ORNL		NDA
Aroclor 1248	C	12672296		0.002	ORNL	1	ORNL		NDA
Aroclor 1254	N	11097691		0.002	ORNL	72	ORNL		NDA
Aroclor 1260	C	11096825		94	ORNL	63	ORNL		NDA
Polychlorinated terphenyls (PCTs)	C	0			NDA		NDA		NDA
Polynuclear aromatic hydrocarbons									

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				Surface Water		Sediment		Surface Soil	
Contaminant		CAS	VOC	µg/L		mg/kg		mg/kg	
Acenaphthene	N	83329		23	ORNL	0.09	ORNL	20	ORNL
Anthracene	N	120127		0.7	ORNL	0.3	ORNL		NDA
Benzo[a]anthracene	C	56553		0.004	EPAR	0.1	ORNL		NDA
Benzo[b]fluoranthene	C	205992		0.004	EPAR	4	ORNL		NDA
Benzo[k]fluoranthene	C	207089		0.004	EPAR	4	ORNL		NDA
Benzo[a]pyrene	C	50328		0.004	EPAR	0.1	ORNL		NDA
Carbazole	C	86748			NDA		NDA		NDA
Chrysene	C	218019		0.004	EPAR	0.9	ORNL		NDA
Dibenz[ah]anthracene	C	53703		0.004	EPAR		NDA		NDA
Fluoranthene	N	206440		6	ECTX	0.8	ORNL		NDA
Fluorene	N	86737		4	ECTX	0.1	ORNL	30	ORNL
Indeno[1,2,3-cd]pyrene	C	193395		0.004	EPAR	0.8	ORNL		NDA
2-Methylnapthalene	N	91576			NDA		NDA		NDA
Naphthalene	N	91203		12	ORNL	0.4	ORNL		NDA
Phenanthrene	N	85018		6	ECTX	0.5	ORNL		NDA
Pyrene	N	129000		960	EPAR		NDA		NDA
N-Propylbenzene	N				NDA		NDA		NDA
Prometon	N	1610180			NDA		NDA		NDA
Prometryn	N	7287196			NDA		NDA		NDA
Propachlor	N	1918167			NDA		NDA		NDA
Propanil	N	709988			NDA		NDA		NDA
Propargite	N	2312358			NDA		NDA		NDA
Propylene glycol	N	57556			NDA		NDA		NDA
Propylene glycol, monoethyl ether	N	52125538			NDA		NDA		NDA
Propylene glycol, monomethyl ether	N	107982			NDA		NDA		NDA
Pursuit	N	81335775			NDA		NDA		NDA
Pyridine	N	110861			NDA		NDA		NDA
Quinoline	C	91225			NDA		NDA		NDA
RDX	C	121824			NDA		NDA		NDA
Resmethrin	N	10463868			NDA		NDA		NDA
Ronnel	N	299843			NDA		NDA		NDA
Rotenone	N	83794			NDA		NDA		NDA
Selenious Acid	N	7783008			NDA		NDA		NDA
Selenium	N	7782492		0.4	ORNL		NDA	0.2	ORNL
Silver and compounds	N	7440224		0.4	ORNL	1	ORNL	2	ORNL
Simazine	C	122349			NDA		NDA		NDA
Sodium azide	N	26628228			NDA		NDA		NDA
Sodium diethyldithiocarbamate	C	148185			NDA		NDA		NDA
Strontium, stable	N	7440246		1500	ORNL		NDA		NDA
Strychnine	N	57249			NDA		NDA		NDA
Styrene	N	100425	☒		NDA		NDA	300	ORNL
2,3,7,8-TCDD (dioxin)	C	1746016			NDA		NDA	3.E-06	ORNL
1,2,4,5-Tetrachlorobenzene	N	95943	☒		NDA		NDA		NDA
1,1,1,2-Tetrachloroethane	C	630206	☒		NDA		NDA		NDA
1,1,2,2-Tetrachloroethane	C	79345	☒	0.2	EPAR	0.9	ECTX		NDA
Tetrachloroethylene (PCE)	C	127184	☒	0.8	EPAR	0.5	ECTX		NDA
2,3,4,6-Tetrachlorophenol	N	58902			NDA		NDA		NDA
p,a,a,a-Tetrachlorotoluene	C	5216251	☒		NDA		NDA		NDA
Tetraethyl lead	N	78002			NDA		NDA		NDA
Tetrahydrofuran	C	109999			NDA		NDA		NDA
Tetryl	N	479458			NDA		NDA		NDA
Thallic oxide	N	1314325			NDA		NDA		NDA
Thallium	N	7440280		9	ORNL		NDA	1	ORNL
Thallium acetate	N	563688			NDA		NDA		NDA

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			VOC	Surface Water		Sediment		Surface Soil	
Contaminant		CAS		µg/L		mg/kg		mg/kg	
Thallium carbonate	N	6533739			NDA		NDA		NDA
Thallium chloride	N	7791120			NDA		NDA		NDA
Thallium nitrate	N	10102451			NDA		NDA		NDA
Thallium sulfate	N	7446186			NDA		NDA		NDA
Thiobencarb	N	28249776			NDA		NDA		NDA
Tin and compounds	N	7440315		73	ORNL		NDA	50	ORNL
Titanium	N	7440326			NDA		NDA		NDA
Titanium Dioxide	N	13463677			NDA		NDA		NDA
Toluene	N	108883	☒	10	ORNL	0.05	ORNL	200	ORNL
Toluene-2,4-diamine	C	95807			NDA		NDA		NDA
Toluene-2,5-diamine	N	95705			NDA		NDA		NDA
Toluene-2,6-diamine	N	823405			NDA		NDA		NDA
p-Toluidine	C	106490			NDA		NDA		NDA
Toxaphene	C	8001352		0.8	DWQ	0.03	ECTX		NDA
1,2,4-Tribromobenzene	N	615543	☒		NDA		NDA		NDA
Tributyltin oxide (TBTO)	N	56359			NDA		NDA		NDA
2,4,6-Trichloroaniline	C	634935			NDA		NDA		NDA
1,2,4-Trichlorobenzene	N	120821	☒	110	ECTX	9	ECTX	20	ORNL
1,1,1-Trichloroethane	N	71556	☒	11	ORNL	0.2	ECTX		NDA
1,1,2-Trichloroethane	C	79005	☒	0.6	EPAR	1	ORNL		NDA
Trichloroethylene (TCE)	C	79016	☒	3	EPAR	1	ORNL		NDA
Trichlorofluoromethane	N	75694	☒		NDA		NDA		NDA
2,4,5-Trichlorophenol	N	95954			NDA		NDA	9	ORNL
2,4,6-Trichlorophenol	C	88062		2	EPAR		NDA	10	ORNL
2,4,5-Trichlorophenoxyacetic acid	N	93765			NDA		NDA		NDA
2-(2,4,5-Trichlorophenoxy)propionic acid	N	93721			NDA		NDA		NDA
1,1,2-Trichloropropane	N	598776	☒		NDA		NDA		NDA
1,2,3-Trichloropropane	C	96184	☒		NDA		NDA		NDA
1,2,3-Trichloropropene	N	96195	☒		NDA		NDA		NDA
1,1,2-Trichloro-1,2,2- trifluoroethane	N	76131	☒		NDA		NDA		NDA
1,2,4-Trimethylbenzene	N	95636	☒		NDA		NDA		NDA
1,3,5-Trimethylbenzene	N	108678	☒		NDA		NDA		NDA
Trimethyl phosphate	C	512561			NDA		NDA		NDA
1,3,5-Trinitrobenzene	N	99354			NDA		NDA		NDA
2,4,6-Trinitrotoluene	C	118967			NDA		NDA		NDA
Uranium (soluble salts)	N	7440611		3	ORNL		NDA	5	ORNL
Vanadium	N	7440622		19	ECTX		NDA	2	ORNL
Vanadium pentoxide	N	1314621			NDA		NDA		NDA
Vanadium sulfate	N	36907423			NDA		NDA		NDA
Vinclozolin	N	50471448			NDA		NDA		NDA
Vinyl acetate	N	108054		16	ORNL	8.E-04	ORNL		NDA
Vinyl chloride	C	75014	☒	2	EPAR	0.02	ORNL		NDA
Warfarin	N	81812			NDA		NDA		NDA
m-Xylene	N	108323	☒		NDA		NDA		NDA
o-Xylene	N	95476	☒		NDA		NDA		NDA
p-Xylene	N	106423	☒		NDA		NDA		NDA
Xylene (mixed)	N	1330207	☒	2	ORNL	0.03	ECTX		NDA
Zinc and compounds	N	7440666		110	ORNL	150	ECTX	8.5	ORNL
Zinc phosphide	N	1314847			NDA		NDA		NDA
Zineb	N	12122677			NDA		NDA		NDA

ATTACHMENT 4

LIST OF SUPPORTING REFERENCES

BACKGROUND DETERMINATION
HUMAN HEALTH RISK ASSESSMENT
ECOLOGICAL RISK ASSESSMENT
DEMONSTRATION OF ATTAINMENT
EPA REGION 3 RISK-BASED CONCENTRATION TABLE EQUATIONS
TOXICOLOGICAL CONSTANTS USED TO DERIVE URS VALUES
KOC AND KD VALUES USED TO DERIVE SOIL VALUES USING "CALB" APPROACH

Background Determination and Outlier Analysis

Additional information for determining background or conducting outlier analysis in support of background determination can be found in the following references:

- "Outliers in Statistical Data," by V. Barnett and T. Lewis, T., 1994, John Wiley and Sons, New York.

- "Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites," EPA Engineering Forum Issue, EPA Office of Research and Development, EPA/540/5-96/500, December 1995.

- "Guidance for Data Quality Assessment," External Working Draft, EPA QA/G-9, U.S. EPA Quality Assurance Management Staff, Washington, D.C., March 1995.

- "Statistical Methods for Environmental Pollution Monitoring," by R. O. Gilbert, 1987, Van Nostrand Reinhold Company, New York.

- "Robust Procedures for the Identification of Multiple Outliers", Handbook on Chemometrics in Environmental Chemistry - Statistical Methods, Volume 2, Part G, by A. Singh and J. M. Nocerino, 1994, Springer-Verlag, Berlin.

Human Health Risk Assessment

Human health risk screening and assessments should be conducted according to the most recent U.S. EPA guidelines including, but not limited to, the following (note that this guidance list was obtained from the Commonwealth of Pennsylvania Act 2 Guidance Documents - other appropriate references are also applicable):

- USEPA, 1989a. Risk Assessment Guidance for Superfund: Volume 1 - Human Health Evaluation Manual (Part A). Interim Final, Office of Emergency and Remedial Response, Washington, DC. EPA/540/1-89/002.

- USEPA, 1989b. Exposure Factors Handbook. Exposure Assessment Group, Office of Health and Environmental Assessment. EPA/600/8-89/043.

- USEPA, 1991a. Risk Assessment Guidance for Superfund: Volume 1 - Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals). Interim. EPA/540/R-92/003.

- USEPA, 1991b. Human Health Evaluation manual, Supplemental Guidance: "Standard Default Exposure Factors". Office of Solid Waste and Emergency Response Directive 9285.6-03, March 25.

- USEPA, 1991c. Dermal Exposure Assessment: Principles and Applications (Interim Report). Office of Research and Development. EPA/600/8-91/011B. NTIS PB92205665.

- USEPA, 1991d. Handbook, Ground Water, Volume II: Methodology, EPA/625/6-90/016b.

- USEPA, 1992a. Guidance on risk characterization for risk managers, and risk assessors. Washington, D.C.: USEPA Memorandum from F. Henry Habicht II, Deputy Administrator, Feb 26, p. 6 with p. 34 attachment entitled Guidance for Risk Assessment.

- USEPA, 1992b. Guidelines for exposure assessment; Notice. Fed Reg., Washington, D.C., May 29. p. 22888-22938.

- USEPA, 1992c. Supplemental guidance to RAGS: Calculating the concentration term. Washington, D.C.: Office of Solid Waste and Emergency Response. Publication 9285.7-081. May.

- USEPA, 1994. Use of Monte Carlo Simulations in Risk Assessments, EPA 903-F-94-001, Region III, Philadelphia, PA, February.

- USEPA, 1995a. Land Use in the CERCLA Remedy Selection Process. OSWER Directive 9355.7-04. March.

- USEPA, 1995b. Policy for Risk Characterization at the US Environmental Protection Agency. (Available at Internet: http://www.epa.gov/ORD/spc/rcpolicy.htm)

- USEPA, 1995c. The Use of Monte Carlo Simulation in Risk Assessment. Region VIII Superfund Technical Guidance, RA-10, Denver, CO, September.

- USEPA, 1995d. Guidance for Risk Characterization. Science Policy Council, February. (Available at Internet: http://www.epa.gov/ORD/spc/rcguide.htm)

- USEPA, 1996a. Technical Background Document for Soil Screening Guidance. 9355.4-17A, EPA/540/R-95/041.

- USEPA, 1996b. Proposed Guidelines for Carcinogen Risk Assessment, EPA/600/P-92/003C, April.

- USEPA, 1996c. Summary Report for the Workshop on Monte Carlo Analysis. EPA/630/R-96/010. September.

- USEPA, 1996d. Draft Exposure Factors Handbook (3 volumes: Volume I - General Factors - EPA/600/P-95/002Ba; Volume II - Food Ingestion Factors - EPA/600-P-95/002Bb; Volume III - Activity Factors - EPA/600/P-95-002Bc). National Center for Environmental Assessment, August. (Available at internet: http://www.epa.gov/ncea/exposfac.htm)

- USEPA, 1997. Guiding Principles for Interim Final Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual, Part A, Baseline Risk Assessment (RAGS Volume 1 Part A). EPA/540/1-89/002.

- USEPA, 1998. Risk Assessment Guidance for Superfund, Volume I – Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments) – Interim; Publication 9285.7-01D, January 1998.

- Interim Final Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual, Part B, Development of Risk-based Preliminary Remediation Goals (RAGS Volume 1 Part B), OSWER 9285.7-01B, U.S. EPA, Office of Solid Waste and Emergency Response, December 1991.

- Interim Final Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual, Part C, Risk Evaluation of Remedial Alternatives (RAGS Volume 1 Part C). EPA/540/R-92/004.

- Interim Final Human Health Evaluation Manual, Supplemental Guidance, `Standard Default Exposure Factors', OSWER Directive 9285.6-03.

- Interim Final Guidance for Soil Ingestion Rates. OSWER Directive 9850.4.

- Exposure Factors Handbook. EPA/600/8-89/043. (This document is in a process of being updated.)

- Interim Final Guidance for Data Usability in Risk Assessment. EPA/540/G-90/008.

- Superfund Exposure Assessment Manual. EPA/540/1-88/001, OSWER Directive 9285.5-1.

- USEPA Region III Technical Guidance Manual, Risk Assessment, Chemical Concentration Data Near the Detection Limit. EPA/903/8-91/001.

- USEPA Region III Technical Guidance Manual, Risk Assessment, Exposure Point Concentrations in Groundwater. EPA/903/8-91/002.
- USEPA Region III Technical Guidance Manual, Risk Assessment, Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening. EPA/903/R-93-001.
- USEPA Region III Technical Guidance Manual, Risk Assessment, Assessing Dermal Exposure from Soil. EPA/903-K-95-003.
- Guiding Principles for Monte Carlo Analysis. EPA/630/R-97/001.
- Dermal Exposure Assessment: Principles and Applications (Interim Report). US EPA Office of Research and Development. EPA/600/8-91/011B. NTIS PB92205665.
- Guidelines for exposure assessment; 57 Fed Reg., May 29, 1992, p. 22888-22938.
- Guidelines for Developmental Toxicity Risk Assessment; 56 Fed Reg., December 5, 1991, p. 63798-63826.
- Guidelines for Reproductive Toxicity Risk Assessment; 61 Fed Reg., October 31, 1996, p. 56274-56322.
- Guidelines for the Health Risk Assessment of Chemical Mixtures; 52 Fed Reg., September 24, 1986, p. 34014-34025.
- Proposed Guidelines for Neurotoxicity Risk Assessment; 60 Fed Reg., October 4, 1995, p. 52032-52056.
- Guidelines for Mutagenicity Risk Assessment; 51 Fed Reg., September 24, 1986, p. 34006-34012.
- Proposed Guidelines for Carcinogen Risk Assessment; 61 Fed Reg., April 23, 1996, p. 17960-18011.
- Guidance for Risk Characterization; USEPA Science Policy Council, February 1995. (Available at Internet: http://www.epa.gov/ORD/spc/rcguide.htm).
- American Industrial Health Council, "Exposure Factors Sourcebook", 1994.
- American Society for Testing and Materials, "Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites," E-1739, Philadelphia, PA, Tier 2 Guidance Manual.
- Bowers, T., B. D. Beck, H.S. Karam, 1994. Assessing the Relations Between Environmental Lead Concentrations and Adult Blood Lead Levels, Risk Analysis, Volume 14 p.183-189.

- Burmaster, D. E., and P.D. Anderson, 1994. Principles of Good Practice for the Use of Monte Carlo Techniques in Human Health and Ecological Risk Assessments. Risk Analysis, Volume 14, Number 4, pp 477 - 481.

- Burmaster, D. E., K.J. Lloyd and K.M. Thompson, 1995. The Need for New Methods to Backcalculate Soil CleanUp Tragets in Interval and Probabilistic Cancer Risk Assessments. Human and Ecological Risk Assessment, Vol 1, No 1, pp 89 - 100.

- Burmaster, D. E. and K.M. Thompson, 1995. BackCalculating CleanUp Targets in Probabilistic Risk AssessmentsWhen the Acceptability of Cancer Risk is Defined Under Different Risk Management. Human and Ecological Risk Assessment, Vol 1, No 1, pp 101 - 120.

- Hawkins, N.C., M.A. Jayjock, and J. Lynch, 1992. A rationale and framework for establishing the quality of human exposure assessments. American Industrial Hygiene Association Journal 53:34-41.

- ASTM E 1739, Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites.

- ASTM E 1689, Standard Guide for Developing Conceptual Site Models for Contaminated Sites.

- ASTM E 978, Standard Practice for Evaluating Mathematical Models for the Environmental Fate of Chemicals.

Where the use of fate and transport models and methods are proposed to estimate exposure concentrations and to develop site-specific standards, the following models, methods, and/or guidance should be considered. However, numerous other models, methods, and/or other guidance, where appropriate, are also applicable:

Groundwater Models

Various groundwater models have been identified in the following documents (note that this listing of references was derived from the Commonwealth of Pennsylvania Act 2 Guidance Documents - other appropriate references are also applicable):

- Section 3.5 of U.S. EPA's "Superfund Exposure Assessment Manual", EPA/540/1-88/001, OSWER Directive 9285.5-1, April 1988.

- EPA. "Selection Criteria for Mathematical Models Used in Exposure Assessments: Ground-Water Models," 600/8-88/075, 1988.

- EPA "Groundwater Modeling: An Overview and Status Report," EPA/600/2-89/028 (NTIS PB89-229497). (Also available from International Ground Water Modeling Center, Institute for Ground-Water Research and Education, Colorado School of Mines, Golden, Colorado 80401.)

- National Academy of Sciences (NAS). "Ground Water Models: Scientific and Regulatory Applications." National Academy Press, Washington, DC. 1990.

- EPA. "Ground Water Modeling Compendium, Second Edition" EPA-500-B-94-003. 1994. Resource Management and Information Staff, Office of Solid Waste and Emergency Response, Washington, DC 20460.

- van der Heijde, P. M. "Identification and Compilation of Unsaturated/Vadose Zone Models". EPA/600/R-94/028. 1994. R.S. Kerr Environmental Research Laboratory, Office of Research and Development, U.S. EPA, Ada, OK.

- EPA. "Compilation of Ground-Water Models". EPA/600/R-93/118. 1993. Office of Research and Development, Washington, DC 20460.

Additional information regarding groundwater models may be obtained from the following sources:

- EPA, Center for Exposure Assessment Modeling (CEAM), 960 College Station Road, Athens, Georgia 30605-2700; telephone (706)546-3549;Internet address: ftp://ftp.epa.gov/epa_ceam/wwwhtml/ceamhome.htm

- EPA, Robert S. Kerr Environmental Research Laboratory, Center for Subsurface Modeling Support (CSMOS), P. O. Box 1198, Ada, Oklahoma 74820; telephone (405)436-8586; Internet address: http://www.epa.gov/ada/csmos.html

- International Ground-Water Modeling Center (IGWMC), Institute for Ground-Water Research and Education, Colorado School of Mines, Golden, Colorado 80401. Internet address: http://www.mines.edu/igwmc/

Any person planning to select and run computer models in analyzing contaminant migration should consult the following EPA or ASTM documents for guidance (note that this listing of references was derived from the Commonwealth of Pennsylvania Act 2 Guidance Documents - other appropriate references are also applicable):

- "Selection Criteria for Mathematical Models Used in Exposure Assessments: Ground-Water Models," 600/8-88/075, 1988.

- EPA. "Ground Water Modeling Compendium, Second Edition" EPA-500-B-94-003. 1994. Resource Management and Information Staff, Office of Solid Waste and Emergency Response, Washington, DC.

- EPA. "Assessment Framework for Ground Water Modeling Applications". EPA-500-B-94-004. July 1994. OSWER Directive 9029.00. Office of Solid Waste and Emergency Response, Washington, DC.

- EPA. "Quality Assurance and Quality Control in the Development and Application of Ground-Water Models". EPA/600/R-93/011. September 1992. Office of Research and Development, Washington, DC 20460.

- ASTM E 978, Standard Practice for Evaluating Mathematical Models for the Environmental Fate of Chemicals.

In addition, the following quality assurance and quality control procedures as described in Chapter 6 (relating to Models and Computers in Ground-Water Investigation) of U.S. EPA's Handbook, Ground Water, Volume II: Methodology, EPA/625/6-90/016b, July 1991, should be considered:

1. Verification of the mathematical basis of a model by comparing its output with known analytical solutions to specific problems.

2. Validation of the applicability of a model to various problem categories by successful simulation of observed field data.

3. Calibrating the model using one set of historical records; the aquifer coefficients and other model parameters are adjusted to achieve the best match between model outputs and known data.

4. Attempting to predict a subsequent set of historical records; No adjustments are made except for actual changes. A mismatch means that the model either is not correctly formulated or does not treat all of the important phenomena affecting the actual field situation.

5. Benchmarking the efficiency of a model in solving problems by comparison with the performance of other models.

6. Critical review of the problem conceptualization to ensure that the modeling effort considers all physical, chemical, and biological processes that may affect the problem.

7. Evaluation of the specifics of the model's application (e.g., appropriateness of the boundary conditions, grid design, time steps, etc. Calibration and sensitivity analysis to determine if the model outputs vary greatly with the changes in input parameters are important aspects of this process.

Surface Water Models:

Useful surface water models are identified in the following documents (note that this listing of references was derived from the Commonwealth of Pennsylvania Act 2 Guidance Documents - other appropriate references are also applicable):

- Section 3.4 of U.S. EPA's "Superfund Exposure Assessment Manual", EPA/540/1-88/001, OSWER Directive 9285.5-1. April 1988.

- "Selection Criteria for Mathematical Models Used in Exposure Assessments: Surface Water Models" Office of Health and Environmental Assessment. EPA/600/8-87/042. 1987.

- "Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water-Part I." EPA/600/6-85/002a. September 1985. Environmental Research Laboratory, U.S. EPA, Athens, GA 30613.

- "Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water-Part II." EPA/600/6-85/002b. September 1985. Environmental Research Laboratory, U.S. EPA, Athens, GA 30613.

Additional information regarding specific surface water models may be obtained from:

- EPA, Center for Exposure Assessment Modeling (CEAM), 960 College Station Road, Athens, Georgia 30605-2700; telephone (706)546-3549; Internet address: ftp://ftp.epa.gov/epa_ceam/wwwhtml/ceamhome.htm.

Air Models

Useful available air models are identified in the following documents (note that this listing of references was derived from the Commonwealth of Pennsylvania Act 2 Guidance Documents - other appropriate references are also applicable):

- Section 3.3 of U.S. EPA's "Superfund Exposure Assessment Manual", EPA/540/1-88/001, OSWER Directive 9285.5-1. April 1988.

- "Interim Final Air Superfund National Technical Guidance Series (NTGS). Volume IV: Procedures for Dispersion Modeling and Air Monitoring for Superfund Air Pathway Analysis." EPA/450/1-89/004. Office of Air Quality Planning and Standards, U.S. EPA, Research Triangle Park, NC.

- "Compilation of Air Pollutant Emission Factors. Volume I. Stationary Point and Area Sources, and Supplements (AP-41)." Fourth Edition. Office of Air Quality Planning and Standards. U.S. EPA, Research Triangle Park, NC.

- "Guideline for Air Quality Models (Revised)" (GAQM), EPA-450/2-78-027R, July 1986. (40 CFR Part 51, Appendix W)

Where the use of computer models for analyzing air contaminant migration is proposed, the following models, methods, and/or guidance, at a minimum, should be considered:

- "Guideline for Air Quality Models (Revised)" (GAQM), EPA-450/2-78-027R, July 1986. (40 CFR Part 51, Appendix W)

- "Guideline for Air Quality Models (Revised)" (GAQM), EPA-450/2-78-027R, July 1986. (40 CFR Part 51, Appendix W)

- "Interim Final Air Superfund National Technical Guidance Series (NTGS). Volume IV: Procedures for Dispersion Modeling and Air Monitoring for Superfund Air Pathway Analysis." EPA/450/1-89/004. Office of Air Quality Planning and Standards, U.S. EPA, Research Triangle Park. NC.

Ecological Risk Assessment

Ecological risk screening and assessments should be conducted according to the most recent U.S. EPA guidelines which are included in, but not limited to, the following references:

- Interim Final Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, EPA-540-R-97-006. PB97-963211.

- Ecotox Thresholds, Developed by ABB Environmental Services, Inc., Under contract to Research Triangle Institute, U.S. EPA, Office of Emergency and Remedial Response, Hazardous Site Evaluation Division, Washington, D.C., EPA/540/F-95/038, January 1996.

- Standard Evaluation Procedure, Ecological Risk Assessment, EPA Hazard Evaluation Division, Office of Pesticide Programs, EPA-540/9-85-001, 1986.

- User's Manual for Ecological Risk Assessment, Oak Ridge National Laboratory, ORNL-6251, 1986

- Ecological Risk Estimation by S.M.Bartell, R.H. Gardner, and R.V. Oneill, Lewis Publishers, Chelsea, MI, 1992

- Ecological Risk Assessment of Priority Substances under the Canadian Environmental Protection Act, Guidance Manual, Draft 1.0, Environment Canada Chemicals Evaluation Division, Hull, Quebec, Canada, 1995

- Ecological Risk Management in the Superfund and RCRA Programs, EPA/230-03-89-045, 1989.

- Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation Manual, EPA/540/1-89/001, 1989.

- Framework for Ecological Risk Assessment, EPA/630/R-92/001, 1992.

- Peer Review Workshop Report on a Framework for Ecological Risk Assessment, EPA/625/3-91/022, 1992.

- Report on the Ecological Risk Assessment Guidelines Strategic Planning Workshop, EPA/630/R-92/002, 1992.

- A Review of Ecological Assessment Case Studies from a Risk Assessment Perspective, Volume 1, EPA/630/R-92/005, 1993.

- A Review of Ecological Assessment Case Studies from a Risk Assessment Perspective, Volume II, EPA/630/R-94/003, 1994.

- Ecological Risk Assessment Issue Papers, EPA/630/R-94/009, 1994.

- Peer Review Workshop Report on Ecological Risk Assessment Issue Papers, EPA/630/R-94/008.

- Ecological Risk A Primer for Risk Managers, EPA/734/R-95/001, 1995.

- Summary Report on Issues in Ecological Risk Assessment by J.H. Gentile, W.H. van der Schalie, and W.P. Wood, EPA/625/3-91/018, 1991.

- Evaluation of Terrestrial Indicators for use in Ecological Risk Assessments at Hazardous Waste Sites (ERL-COR-752) by G. Linder, et al., USEPA Environmental Research Laboratory, Corvallis, OR, PB93-100865.

- Evaluation Protocols for Aquatic Ecological Risk Assessment and Risk Management by B.R. Parkhurst, et al., WPCF Research Foundation, Technology Assessment Department, Alexandria, VA.

- Ecological Risk Assessment by G. W. Suter, Lewis Publishers, Chelsea, MI.

- Managing Ecological Risks at EPA Issues and Recommendations for Progress, by M.E. Troyer and M.S. Brody, EPA/600/R-94/183, 1994.

- Ecological Assessment of Hazardous Waste Sites A field and laboratory reference document, EPA/600/3-89/013, 1989.

- Procedural Guidelines for Ecological Risk Assessments at U.S. Army Sites, Volume I, Edgewood Research, Development & Engineering Center, U.S. Army Chemical and Biological Defense Command, ERDEC-TR-221, 1994.

Demonstration of Attainment

Additional information for demonstrating attainment with remediation standards, specifically with respect to statistical methods and approaches, can be found in the following references. Other appropriate references are also applicable.

- Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media, U.S. EPA Office of Policy, Planning, and Evaluation, EPA 230/02-89-042, Washington DC, 1989;

- Methods for Evaluating the Attainment of Cleanup Standards, Volume 2: Ground Water, U.S. EPA Office of Policy, Planning, and Evaluation, PB94-138815, Washington DC, July 1992;

- Statistical Methods for Evaluating the Attainment of Cleanup Standards, Volume 3: Reference-Based Standards for Soils and Solid Media, EPA Office of Policy, Planning, and Evaluation, PB94-176831, Washington DC, July 1992;

- Test Methods for Evaluating Solid Waste, SW-846 Volume II: Field Methods, U.S. EPA Office of Solid Waste Management Division, 3rd edition, November 1985;

- Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance, U.S. EPA Office of Solid Waste Management Division, 3rd edition, April 1989;

- Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance, U.S. EPA Office of Solid Waste Management Division, 3rd edition, June1992.

EPA REGION III RISK-BASED CONCENTRATION TABLE:
TECHNICAL BACKGROUND INFORMATION

originally developed by Roy L. Smith, Ph.D., Toxicologist
revised 4/12/99 by Jennifer Hubbard, Toxicologist

Development of Risk-Based Concentrations

General

Separate carcinogenic and non-carcinogenic risk-based concentrations were calculated for each compound for each pathway. The concentration in the table is the lower of the two, rounded to two significant figures. The following terms and values were used in the calculations:

Exposure variables	Value	Symboll
General:		
Carcinogenic potency slope oral (risk per mg/kg/d):	*	CPSo
Carcinogenic potency slope inhaled (risk per mg/kg/d):	*	CPSi
Reference dose oral (mg/kg/d):	*	RfDo
Reference dose inhaled (mg/kg/d):	*	RfDi
Target cancer risk:	1e-06	TR
Target hazard quotient:	1	THQ
Body weight, adult (kg):	70	BWa
Body weight, age 1-6 (kg):	15	BWc
Averaging time carcinogens (d):	25550	ATc
Averaging time non-carcinogens (d):	ED*365	ATn
Inhalation, adult (m3/d):	20	IRAa
Inhalation, child (m3/d):	12	IRAc
Inhalation factor, age-adjusted (m3-y/kg-d):	11.66	IFAadj
Tap water ingestion, adult (L/d):	2	IRWa
Tap water ingestion, age 1-6 (L/d):	1	IRWc
Tap water ingestion factor, age-adjusted (L-y/kg-d):	1.09	IFWadj
Fish ingestion (g/d):	54	IRF
Soil ingestion, adult (mg/d):	100	IRSa
Soil ingestion, age 1-6 (mg/d):	200	IRSc
Soil ingestion factor, age adjusted (mg-y/kg-d):	114.29	IFSadj
Residential:		
Exposure frequency (d/y):	350	EFr
Exposure duration, total (y):	30	EDtot
Exposure duration, age 1-6 (y):	6	EDc
Volatilization factor (L/m3):	0.5	K
Occupational:		
Exposure frequency (d/y):	250	EFo
Exposure duration (y):	25	EDo
Fraction of contaminated soil ingested (unitless)	0.5	FC

*: Contaminant-specific toxicological constants. The priority among sources of toxicological constants was as follows: (1) IRIS, (2) HEAST, (3) HEAST alternative method, (4) EPA-NCEA Superfund Health Risk Technical Support Center, (5) withdrawn from IRIS or HEAST, and (6) other EPA documents. Each source was used only if numbers from higher-priority sources were unavailable, unless NCEA indicated a newer provisional value was superior to an older HEAST value. The EPA Superfund Health Risk Technical Support Center, part of the EPA National Center for Environmental Assessment in Cincinnati, develops provisional RfDs and CPSs on request for contaminants not in IRIS or HEAST. These provisional values are labeled "E = EPA-NCEA provisional" in the table. It is possible they may be obsolete. If one of the "E" constants is important to a Superfund risk assessment, consider requesting, through a Regional risk assessor, a new provisional value.

Age-adjusted factors

Because contact rates with tap water, ambient air, and residential soil are different for children and adults, carcinogenic risks during the first 30 years of life were calculated using age-adjusted factors. These factors approximated the integrated exposure from birth until age 30 by combining contact rates, body weights, and exposure durations for two age groups - small children and adults. The age-adjusted factor for soil was obtained from RAGS IB; the others were developed by analogy.

(1) Air inhalation

$$IFAadj\ \frac{m^3 \cdot y}{kg \cdot d} = \frac{EDc \cdot IRAc}{BWc} + \frac{(EDtot - EDc) \cdot IRAa}{BWa}$$

(2) Tap water ingestion

$$IFWadj\ \frac{L \cdot y}{kg \cdot d} = \frac{EDc \cdot IRWc}{BWc} + \frac{(EDtot - EDc) \cdot IRWa}{BWa}$$

(3) Soil ingestion

$$IFSadj\ \frac{mg \cdot y}{kg \cdot d} = \frac{EDc \cdot IRSc}{BWc} + \frac{(EDtot - EDc) \cdot IRSa}{BWa}$$

Residential water

Volatilization terms were calculated only for compounds with a mark in the "VOC" column. Compounds having a Henry's Law constant greater than 10^{-5} and a molecular weight less than 200 were considered volatile. The list may be incomplete, but is unlikely to include false positives. The equations and the volatilization factor (K, above) were obtained from RAGS IB. Oral potency slopes and reference doses were used for both oral and inhaled exposures for volatile compounds lacking inhalation values. RBCs for carcinogens were based on combined childhood and adult exposure; for non-carcinogens RBCs were based on adult exposure.

(4) Carcinogens

$$RBC\ \frac{\mu g}{L} = \frac{TR \cdot ATc \cdot 1000\frac{\mu g}{mg}}{EFr \cdot ([K \cdot IFAadj \cdot CPSi] + [IFWadj \cdot CPSo])}$$

(5) Non-carcinogens

$$RBC\ \frac{\mu g}{L} = \frac{THQ \cdot BWa \cdot ATn \cdot 1000\frac{\mu g}{mg}}{EFr \cdot EDtot \cdot \left(\frac{K \cdot IRAa}{RfDi} + \frac{IRWa}{RfDo}\right)}$$

Ambient air

Oral potency slopes and references were used where inhalation values were not available. RBCs for carcinogens were based on combined childhood and adult exposure; for non-carcinogens RBCs were based on adult exposure.

(6) Carcinogens

$$RBC\ \frac{\mu g}{m^3} = \frac{TR \cdot ATc \cdot 1000\frac{\mu g}{mg}}{EFr \cdot IFAadj \cdot CPSi}$$

(7) Non-carcinogens

$$RBC\ \frac{\mu g}{m^3} = \frac{THQ \cdot RfDi \cdot BWa \cdot ATn \cdot 1000\frac{\mu g}{mg}}{EFr \cdot EDtot \cdot IRAa}$$

Edible fish

All RBCs were based on adult exposure.

(8) Carcinogens

$$RBC\ \frac{mg}{kg} = \frac{TR \cdot BWa \cdot ATc}{EFr \cdot EDtot \cdot \frac{IRF}{1000\frac{g}{kg}} \cdot CPSo}$$

(9) Non-carcinogens

$$RBC\ \frac{mg}{kg} = \frac{THQ \cdot RfDo \cdot BWa \cdot ATn}{EFr \cdot EDtot \cdot \frac{IRF}{1000\frac{g}{kg}}}$$

Commercial/industrial soil ingestion

RBCs were based on adult occupational exposure, including an assumption that only 50% of total soil ingestion is work-related.

(10) Carcinogens

$$RBC\ \frac{mg}{kg} = \frac{TR \cdot BWa \cdot ATc}{EFo \cdot EDo \cdot \frac{IRSa}{10^6\ \frac{mg}{kg}} \cdot FC \cdot CPSo}$$

(11) Non-carcinogens

$$RBC\ \frac{mg}{kg} = \frac{THQ \cdot RfDo \cdot BWa \cdot ATn}{EFo \cdot EDo \cdot \frac{IRSa}{10^6\ \frac{mg}{kg}} \cdot FC}$$

Residential soil ingestion

RBCs for carcinogens were based on combined childhood and adult exposure; RBCs for non-carcinogens were based on childhood exposure only.

(12) Carcinogens

$$RBC\ \frac{mg}{kg} = \frac{TR \cdot ATc}{EFr \cdot \frac{IFSadj}{10^6\ \frac{mg}{kg}} \cdot CPSo}$$

(13) Non-carcinogens

$$RBC\ \frac{mg}{kg} = \frac{THQ \cdot RfDo \cdot BWc \cdot ATn}{EFr \cdot EDc \cdot \frac{IRSc}{10^6\ \frac{mg}{kg}}}$$

Sources: I = IRIS H = HEAST A = HEAST Alternate W = Withdrawn from IRIS or HEAST												Basis: C = Carcinogenic effects N = Noncarcinogenic effects ! = RBC at HI of 0.1 < RBC-c																					
E = EPA-NCEA provisional value O = other																			Risk-based concentrations												Region III SSLs		
												Tap			Ambient						Soil								Soil, for groundwater migration		
		RfDo			CSFo			RfDi			CSFi				water			air			Fish			Industrial			Residential			DAF 1	DAF 20	
Chemical	CAS	mg/kg/d			1/mg/kg/d			mg/kg/d			1/mg/kg/d			VOC	ug/l			ug/m3			mg/kg			mg/kg			mg/kg			mg/kg	mg/kg	
ACETALDEHYDE	75070							2.57E-03	I		7.7E-03	I		y	1.6E+00	C		8.1E-01	C												3.8E-04	7.7E-03	C
ACETOCHLOR	3.4E+07	2E-02	I												7.3E+02	N		7.3E+01	N		2.7E+01	N		4.1E+04	N		1.6E+03	N				
ACETONE	67641	1.00E-01	I											y	6.1E+02	N		3.7E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N		1.2E-01	2.5E+00	N
ACETONITRILE	75058							1.7E-02	I					y	1.2E+02	N		6.2E+01	N												2.9E-02	5.8E-01	N
ACETOPHENONE	98862	1.00E-01	I					5.70E-06	W					y	4.2E-02	N		2.1E-02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N		1.1E-05	2.2E-04	N
ACROLEIN	107028	2.00E-02	H					5.70E-06	I					y	4.2E-02	N		2.1E-02	N		2.7E+01	N		4.1E+04	N		1.6E+03	N		1.0E-05	2.0E-04	N
ACRYLAMIDE	79061	2.00E-04	I		4.50E+00	I					4.50E+00	I			1.5E-02	C		1.4E-03	C		7.0E-04	C		1.3E+00	C		1.4E-01	C		3.7E-06	7.4E-05	C
ACRYLONITRILE	107131	1.00E-03	H		5.40E-01	I		5.70E-04	I		2.40E-01	I		y	3.7E-02	C		2.6E-02	C		5.8E-03	C		1.1E+01	C		1.2E+00	C		7.4E-06	1.5E-04	C
ALACHLOR	1.6E+07	1.00E-02	I		8.00E-02	H									8.4E-01	C		7.8E-02	C		3.9E-02	C		7.2E+01	C		8.0E+00	C		3.5E-04	7.0E-03	C
ALAR	1596845	1.50E-01	I												5.5E+03	N		5.5E+02	N		2.0E+02	N		3.1E+05	N		1.2E+04	N				
ALDICARB	116063	1.00E-03	I												3.7E+01	N		3.7E+00	N		1.4E+00	N		2.0E+03	N		7.8E+01	N		1.0E-02	2.1E-01	N
ALDICARB SULFONE	1646884	1.00E-03	I												3.7E+01	N		3.7E+00	N		1.4E+00	N		2.0E+03	N		7.8E+01	N		7.5E-03	1.5E-01	N
ALDRIN	309002	3.00E-05	I		1.70E+01	I					1.70E+01	I			3.9E-03	C		3.7E-04	C		1.9E-04	C		3.4E-01	C		3.8E-02	C		3.8E-04	7.7E-03	C
ALUMINUM	7429905	1.00E+00	E					1.00E-03	E						3.7E+04	N		3.7E+00	N		1.4E+03	N		2.0E+06	N		7.8E+04	N				
AMINODINITROTOLUENES		6.00E-05	E												2.2E+00	N		2.2E-01	N		8.1E-02	N		1.2E+02	N		4.7E+00	N				
4-AMINOPYRIDINE	504245	2.00E-05	H												7.3E-01	N		7.3E-02	N		2.7E-02	N		4.1E+01	N		1.6E+00	N				
AMMONIA	7664417							2.86E-02	I					y	2.1E+02	N		1.0E+02	N														
ANILINE	62533	7.00E-03	E		5.70E-03	I		2.90E-04	I						1.2E+01	C		1.1E+00	N		5.5E-01	C		1.0E+03	C		1.1E+02	C	!	6.8E-03	1.4E-01	C
ANTIMONY	7440360	4.00E-04	I												1.5E+01	N		1.5E+00	N		5.4E-01	N		8.2E+02	N		3.1E+01	N		6.6E-01	1.3E+01	N
ANTIMONY PENTOXIDE	1314609	5.00E-04	H												1.8E+01	N		1.8E+00	N		6.8E-01	N		1.0E+03	N		3.9E+01	N				
ANTIMONY TETROXIDE	1332816	4.00E-04	H												1.5E+01	N		1.5E+00	N		5.4E-01	N		8.2E+02	N		3.1E+01	N				
ANTIMONY TRIOXIDE	1309644	4.00E-04	H					5.70E-05	I						1.5E+01	N		2.1E-01	N		5.4E-01	N		8.2E+02	N		3.1E+01	N				
ARSENIC	7440382	3.00E-04	I		1.50E+00	I					1.51E+01	I			4.5E-02	C		4.1E-04	C		2.1E-03	C		3.8E+00	C		4.3E-01	C		1.3E-03	2.6E-02	C
ARSINE	7784421							1.40E-05	I					y	1.0E-01	N		5.1E-02	N														
ASSURE	7.7E+07	9.00E-03	I												3.3E+02	N		3.3E+01	N		1.2E+01	N		1.8E+04	N		7.0E+02	N				
ATRAZINE	1912249	3.50E-02	I		2.20E-01	H									3.0E-01	C		2.8E-02	C		1.4E-02	C		2.6E+01	C		2.9E+00	C		4.4E-04	8.8E-03	C
AZOBENZENE	103333				1.10E-01	I					1.10E-01	I			6.1E-01	C		5.7E-02	C		2.9E-02	C		5.2E+01	C		5.8E+00	C		1.8E-03	3.5E-02	C
BARIUM	7440393	7.00E-02	I					1.40E-04	A						2.6E+03	N		5.1E-01	N		9.5E+01	N		1.4E+05	N		5.5E+03	N		1.1E+02	2.1E+03	N
BAYGON	114261	4.00E-03	I												1.5E+02	N		1.5E+01	N		5.4E+00	N		8.2E+03	N		3.1E+02	N				
BAYTHROID	6.8E+07	2.50E-02	I												9.1E+02	N		9.1E+01	N		3.4E+01	N		5.1E+04	N		2.0E+03	N				
BENTAZON	2.5E+07	3.00E-02	I												1.1E+03	N		1.1E+02	N		4.1E+01	N		6.1E+04	N		2.3E+03	N				
BENZALDEHYDE	100527	1.00E-01	I												3.7E+03	N		3.7E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N				
BENZENE	71432	3.00E-03	E		2.90E-02	I		1.70E-03	E		2.90E-02	I		y	3.6E-01	C		2.2E-01	C		1.1E-01	C		2.0E+02	C		2.2E+01	C		1.0E-04	2.1E-03	C
BENZENETHIOL	108985	1.00E-05	H											y	6.1E-02	N		3.7E-02	N		1.4E-02	N		2.0E+01	N		7.8E-01	N				
BENZIDINE	92875	3.00E-03	I		2.30E+02	I					2.30E+02	I			2.9E-04	C		2.7E-05	C		1.4E-05	C		2.5E-02	C		2.8E-03	C				
BENZOIC ACID	65850	4.00E+00	I												1.5E+05	N		1.5E+04	N		5.4E+03	N		8.2E+06	N		3.1E+05	N				
BENZYL ALCOHOL	100516	3.00E-01	H												1.1E+04	N		1.1E+03	N		4.1E+02	N		6.1E+05	N		2.3E+04	N		4.4E+00	8.8E+01	N
BENZYL CHLORIDE	100447				0.17	I								y	6.2E-02	C		3.7E-02	C		1.9E-02	C		3.4E+01	C		3.8E+00	C		1.9E-05	3.7E-04	C
BERYLLIUM	7440417	2.00E-03	I					5.7E-06	I		8.40E+00	I			7.3E+01	N		7.5E-04	C		2.7E+00	N		4.1E+03	N		1.6E+02	N		5.8E+01	1.2E+03	N
BIPHENYL	92524	5.00E-02	I											y	3.0E+02	N		1.8E+02	N		6.8E+01	N		1.0E+05	N		3.9E+03	N		4.8E+00	9.6E+01	N
BIS(2-CHLOROETHYL)ETHER	111444				1.10E+00	I					1.10E+00	I		y	9.6E-03	C		5.7E-03	C		2.9E-03	C		5.2E+00	C		5.8E-01	C		2.2E-06	4.4E-05	C
BIS(2-CHLOROISOPROPYL)ETHER	108601	4.00E-02	I		7.00E-02	H					3.50E-02	H		y	2.6E-01	C		1.8E-01	C		4.5E-02	C		8.2E+01	C		9.1E+00	C		8.4E-05	1.7E-03	C
BIS(CHLOROMETHYL)ETHER	542881				2.20E+02	I					2.20E+02	I		y	4.8E-05	C		2.8E-05	C		1.4E-05	C		2.6E-02	C		2.9E-03	C		9.7E-09	1.9E-07	C

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												Tap			Ambient						Soil								Soil, for groundwater migration		
		RfDo		CSFo		RfDi		CSFi				water			air			Fish			Industrial			Residential			DAF 1		DAF 20			
Chemical	CAS	mg/kg/d		1/mg/kg/d		mg/kg/d		1/mg/kg/d		VOC		ug/l			ug/m3			mg/kg			mg/kg			mg/kg			mg/kg		mg/kg			
BIS(2-ETHYLHEXYL)PHTHALATE	117817	2.00E-02	I	1.40E-02	I			1.40E-02	E			4.8E+00	C		4.5E-01	C		2.3E-01	C		4.1E+02	C		4.6E+01	C		1.4E+02		2.9E+03	C		
BORON	7440428	9.00E-02	I			5.70E-03	H					3.3E+03	N		2.1E+01	N		1.2E+02	N		1.8E+05	N		7.0E+03	N							
BROMODICHLOROMETHANE	75274	2.00E-02	I	6.20E-02	I					y		1.7E-01	C		1.0E-01	C		5.1E-02	C		9.2E+01	C		1.0E+01	C		5.4E-05		1.1E-03	C		
BROMOETHENE	593602					8.6E-04	I	1.10E-01	H	y		1.1E-01	C		5.7E-02	C											5.4E-05		1.1E-03	C		
BROMOFORM	75252	2.00E-02	I	7.90E-03	I			3.90E-03	I			8.5E+00	C		1.6E+00	C		4.0E-01	C		7.2E+02	C		8.1E+01	C		2.0E-01		4.1E+00	C		
BROMOMETHANE	74839	1.40E-03	I			1.40E-03	I			y		8.5E+00	N		5.1E+00	N		1.9E+00	N		2.9E+03	N		1.1E+02	N		2.1E-03		4.1E-02	N		
BROMOPHOS	2104963	5.00E-03	H									1.8E+02	N		1.8E+01	N		6.8E+00	N		1.0E+04	N		3.9E+02	N							
1,3-BUTADIENE	106990							1.80E+00	H	y		7.0E-03	C		3.5E-03	C											3.9E-06		7.8E-05	C		
1-BUTANOL	71363	1.00E-01	I									3.7E+03	N		3.7E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N		7.8E-01		1.6E+01	N		
BUTYLBENZYLPHTHALATE	85687	2.00E-01	I									7.3E+03	N		7.3E+02	N		2.7E+02	N		4.1E+05	N		1.6E+04	N		8.4E+02		1.7E+04	N		
BUTYLATE	2008415	5.00E-02	I									1.8E+03	N		1.8E+02	N		6.8E+01	N		1.0E+05	N		3.9E+03	N							
N-BUTYLBENZENE	104518	1.00E-02	E							y		6.1E+01	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N							
SEC-BUTYLBENZENE	135988	1.00E-02	E							y		6.1E+01	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N							
TERT-BUTYLBENZENE	98066	1.00E-02	E							y		6.1E+01	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N							
**CADMIUM-WATER	7440439	5.00E-04	I			5.7E-05	E	6.30E+00	I			1.8E+01	N		9.9E-04	C		6.8E-01	N		1.0E+03	N		3.9E+01	N		1.4E+00		2.7E+01	N		
**CADMIUM-FOOD	7440439	1.00E-03	I			5.7E-05	E	6.30E+00	I			3.7E+01	N		9.9E-04	C		1.4E+00	N		2.0E+03	N		7.8E+01	N		2.7E+00		5.5E+01	N		
CAPROLACTAM	105602	5.00E-01	I									1.8E+04	N		1.8E+03	N		6.8E+02	N		1.0E+06	N		3.9E+04	N							
CARBARYL	63252	1.00E-01	I									3.7E+03	N		3.7E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N		1.5E+00		3.0E+01	N		
CARBON DISULFIDE	75150	1.00E-01	I			2.00E-01	I			y		1.0E+03	N		7.3E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N		9.5E-01		1.9E+01	N		
CARBON TETRACHLORIDE	56235	7.00E-04	I	1.30E-01	I	5.71E-04	E	5.30E-02	I	y		1.6E-01	C		1.2E-01	C		2.4E-02	C		4.4E+01	C		4.9E+00	C		1.1E-04		2.1E-03	C		
CARBOSULFAN	5.5E+07	1.00E-02	I									3.7E+02	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N							
CHLORAL	75876	2.00E-03	I									7.3E+01	N		7.3E+00	N		2.7E+00	N		4.1E+03	N		1.6E+02	N							
CHLORANIL	118752			4.00E-01	H							1.7E-01	C		1.6E-02	C		7.9E-03	C		1.4E+01	C		1.6E+00	C							
CHLORDANE	57749	5.00E-04	I	3.5E-01	I	2.00E-04	I	3.5E-01	I			1.9E-01	C		1.8E-02	C		9.0E-03	C		1.6E+01	C		1.8E+00	C		4.6E-02		9.2E-01	C		
**CHLORINE	7782505	1.00E-01	I			5.7E-05	E			y		4.2E-01	N		2.1E-01	N		1.4E+02	N		2.0E+05	N		7.8E+03	N							
CHLORINE DIOXIDE	1E+07					5.70E-05	I			y		4.2E-01	N		2.1E-01	N																
CHLOROACETIC ACID	79118	2.00E-03	H									7.3E+01	N		7.3E+00	N		2.7E+00	N		4.1E+03	N		1.6E+02	N							
4-CHLOROANILINE	106478	4.00E-03	I									1.5E+02	N		1.5E+01	N		5.4E+00	N		8.2E+03	N		3.1E+02	N		4.8E-02		9.7E-01	N		
CHLOROBENZENE	108907	2.00E-02	I			1.7E-02	E			y		1.1E+02	N		6.2E+01	N		2.7E+01	N		4.1E+04	N		1.6E+03	N		4.0E-02		8.0E-01	N		
CHLOROBENZILATE	510156	2.00E-02	I	2.70E-01	H			2.70E-01	H			2.5E-01	C		2.3E-02	C		1.2E-02	C		2.1E+01	C		2.4E+00	C		1.3E-03		2.7E-02	C		
P-CHLOROBENZOIC ACID	74113	2.00E-01	H									7.3E+03	N		7.3E+02	N		2.7E+02	N		4.1E+05	N		1.6E+04	N							
2-CHLORO-1,3-BUTADIENE	126998	2.00E-02	A			2.00E-03	H			y		1.4E+01	N		7.3E+00	N		2.7E+01	N		4.1E+04	N		1.6E+03	N		6.0E-03		1.2E-01	N		
1-CHLOROBUTANE	109693	4.00E-01	H							y		2.4E+03	N		1.5E+03	N		5.4E+02	N		8.2E+05	N		3.1E+04	N		1.0E+00		2.0E+01	N		
1-CHLORO-1,1-DIFLUOROETHANE	75683					########	I			y		1.0E+05	N		5.1E+04	N											7.0E+01		1.4E+03	N		
CHLORODIFLUOROMETHANE	75456					########	I			y		1.0E+05	N		5.1E+04	N											7.0E+01		1.4E+03	N		
CHLOROETHANE	75003	4.00E-01	E	2.90E-03	E	########	I			y		3.6E+00	C		2.2E+00	C		1.1E+00	C		2.0E+03	C		2.2E+02	C		9.6E-04		1.9E-02	C		
CHLOROFORM	67663	1.00E-02	I	6.10E-03	I	8.6E-05	E	8.10E-02	I	y		1.5E-01	C	!	7.7E-02	C	!	5.2E-01	C		9.4E+02	C		1.0E+02	C	!	4.5E-05		8.9E-04	C		
CHLOROMETHANE	74873			1.30E-02	H	8.6E-02	E	3.5E-03	E	y		2.1E+00	C		1.8E+00	C		2.4E-01	C		4.4E+02	C		4.9E+01	C		5.2E-04		1.0E-02	C		
4-CHLORO-2-METHYLANILINE	95692			5.80E-01	H							1.2E-01	C		1.1E-02	C		5.4E-03	C		9.9E+00	C		1.1E+00	C							
BETA-CHLORONAPHTHALENE	91587	8.00E-02	I							y		4.9E+02	N		2.9E+02	N		1.1E+02	N		1.6E+05	N		6.3E+03	N		1.6E+00		3.2E+01	N		
O-CHLORONITROBENZENE	88733			2.50E-02	H					y		4.2E-01	C		2.5E-01	C		1.3E-01	C		2.3E+02	C		2.6E+01	C							
P-CHLORONITROBENZENE	100005			1.80E-02	H					y		5.9E-01	C		3.5E-01	C		1.8E-01	C		3.2E+02	C		3.5E+01	C							
2-CHLOROPHENOL	95578	5.00E-03	I							y		3.0E+01	N		1.8E+01	N		6.8E+00	N		1.0E+04	N		3.9E+02	N							

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												Tap			Ambient			Fish			Soil								Soil, for groundwater migration			
		RfDo		CSFo		RfDi		CSFi				water			air			Industrial			Residential								DAF 1		DAF 20		
Chemical	CAS	mg/kg/d		1/mg/kg/d		mg/kg/d		1/mg/kg/d		VOC		ug/l			ug/m3			mg/kg			mg/kg								mg/kg		mg/kg		
2-CHLOROPROPANE	75296					2.90E-02	H			y		2.1E+02	N		1.1E+02	N													6.6E-02		1.3E+00	N	
O-CHLOROTOLUENE	95498	2.00E-02	I							y		1.2E+02	N		7.3E+01	N		2.7E+01	N		4.1E+04	N		1.6E+03	N				6.5E-02		1.3E+00	N	
CHLORPYRIFOS	2921882	3.00E-03	I									1.1E+02	N		1.1E+01	N		4.1E+00	N		6.1E+03	N		2.3E+02	N				3.2E+00		6.3E+01	N	
CHLORPYRIFOS-METHYL	5598130	1.00E-02	H									3.7E+02	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N								
CHROMIUM III	1.6E+07	1.50E+00	I									5.5E+04	N		5.5E+03	N		2.0E+03	N		3.1E+06	N		1.2E+05	N				9.9E+07		2.0E+09	N	
CHROMIUM VI	1.9E+07	3.00E-03	I			3.00E-05	I	4.10E+01	H			1.1E+02	N		1.5E-04	C		4.1E+00	N		6.1E+03	N		2.3E+02	N				2.1E+00		4.2E+01	N	
COBALT	7440484	6.00E-02	E									2.2E+03	N		2.2E+02	N		8.1E+01	N		1.2E+05	N		4.7E+03	N								
COKE OVEN EMISSIONS (COAL TAR)	8007452							2.2	I						2.8E-03	C																	
COPPER	7440508	4.00E-02	H									1.5E+03	N		1.5E+02	N		5.4E+01	N		8.2E+04	N		3.1E+03	N				5.3E+02		1.1E+04	N	
CROTONALDEHYDE	123739			1.90E+00	H					y		5.6E-03	C		3.3E-03	C		1.7E-03	C		3.0E+00	C		3.4E-01	C				1.5E-05		3.1E-04	C	
CUMENE	98828	1.00E-01	I			1.10E-01	I			y		6.6E+02	N		4.0E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N				3.2E+00		6.4E+01	N	
CYANIDE (FREE)	57125	2.00E-02	I									7.3E+02	N		7.3E+01	N		2.7E+01	N		4.1E+04	N		1.6E+03	N				7.4E+00		1.5E+02	N	
CALCIUM CYANIDE	592018	4E-02	I									1.5E+03	N		1.5E+02	N		5.4E+01	N		8.2E+04	N		3.1E+03	N								
COPPER CYANIDE	544923	5.00E-03	I									1.8E+02	N		1.8E+01	N		6.8E+00	N		1.0E+04	N		3.9E+02	N								
CYANAZINE	2.2E+07	2.00E-03	H	8.40E-01	H							8.0E-02	C		7.5E-03	C		3.8E-03	C		6.8E+00	C		7.6E-01	C				2.6E-05		5.3E-04	C	
CYANOGEN	460195	4.00E-02	I							y		2.4E+02	N		1.5E+02	N		5.4E+01	N		8.2E+04	N		3.1E+03	N								
CYANOGEN BROMIDE	506683	9.00E-02	I									3.3E+03	N		3.3E+02	N		1.2E+02	N		1.8E+05	N		7.0E+03	N								
CYANOGEN CHLORIDE	506774	5.00E-02	I									1.8E+03	N		1.8E+02	N		6.8E+01	N		1.0E+05	N		3.9E+03	N								
HYDROGEN CYANIDE	74908	2.00E-02	I			8.60E-04	I			y		6.2E+00	N		3.1E+00	N		2.7E+01	N		4.1E+04	N		1.6E+03	N				1.1E-01		2.2E+00	N	
POTASSIUM CYANIDE	151508	5.00E-02	I									1.8E+03	N		1.8E+02	N		6.8E+01	N		1.0E+05	N		3.9E+03	N								
POTASSIUM SILVER CYANIDE	506616	2.00E-01	I									7.3E+03	N		7.3E+02	N		2.7E+02	N		4.1E+05	N		1.6E+04	N								
SILVER CYANIDE	506649	1.00E-01	I									3.7E+03	N		3.7E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N				3.1E+01		6.2E+02	N	
SODIUM CYANIDE	143339	4.00E-02	I									1.5E+03	N		1.5E+02	N		5.4E+01	N		8.2E+04	N		3.1E+03	N								
**THIOCYANATE		5.00E-02	E									1.8E+03	N		1.8E+02	N		6.8E+01	N		1.0E+05	N		3.9E+03	N								
ZINC CYANIDE	557211	5.00E-02	I									1.8E+03	N		1.8E+02	N		6.8E+01	N		1.0E+05	N		3.9E+03	N				1.1E+02		2.3E+03	N	
CYCLOHEXANONE	108941	5.00E+00	I									1.8E+05	N		1.8E+04	N		6.8E+03	N		1.0E+07	N		3.9E+05	N				6.1E+01		1.2E+03	N	
CYHALOTHRIN/KARATE	6.8E+07	5.00E-03	I									1.8E+02	N		1.8E+01	N		6.8E+00	N		1.0E+04	N		3.9E+02	N								
CYPERMETHRIN	5.2E+07	1.00E-02	I									3.7E+02	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N								
DACTHAL	1861321	1.00E-02	I									3.7E+02	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N								
DALAPON	75990	3.00E-02	I									1.1E+03	N		1.1E+02	N		4.1E+01	N		6.1E+04	N		2.3E+03	N				3.5E-01		7.1E+00	N	
DDD	72548			2.40E-01	I							2.8E-01	C		2.6E-02	C		1.3E-02	C		2.4E+01	C		2.7E+00	C				5.6E-01		1.1E+01	C	
DDE	72559			3.40E-01	I							2.0E-01	C		1.8E-02	C		9.3E-03	C		1.7E+01	C		1.9E+00	C				1.8E+00		3.5E+01	C	
DDT	50293	5.00E-04	I	3.40E-01	I			3.40E-01	I			2.0E-01	C		1.8E-02	C		9.3E-03	C		1.7E+01	C		1.9E+00	C				5.8E-02		1.2E+00	C	
DIAZINON	333415	9.00E-04	H									3.3E+01	N		3.3E+00	N		1.2E+00	N		1.8E+03	N		7.0E+01	N				2.1E-02		4.3E-01	N	
DIBENZOFURAN	132649	4.00E-03	E							y		2.4E+01	N		1.5E+01	N		5.4E+00	N		8.2E+03	N		3.1E+02	N				3.8E-01		7.7E+00	N	
1,4-DIBROMOBENZENE	106376	1.00E-02	I									3.7E+02	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N								
DIBROMOCHLOROMETHANE	124481	2.00E-02	I	8.40E-02	I					y		1.3E-01	C		7.5E-02	C		3.8E-02	C		6.8E+01	C		7.6E+00	C				4.1E-05		8.3E-04	C	
1,2-DIBROMO-3-CHLOROPROPANE	96128			1.40E+00	H	5.70E-05	I	2.40E-03	H	y		4.7E-02	C	!	2.1E-01	N		2.3E-03	C		4.1E+00	C		4.6E-01	C				4.4E-05		8.7E-04	C	
1,2-DIBROMOETHANE	106934			8.50E+01	I	5.70E-05	H	7.60E-01	I	y		7.5E-04	C		8.2E-03	C		3.7E-05	C		6.7E-02	C		7.5E-03	C				4.3E-07		8.5E-06	C	
DIBUTYLPHTHALATE	84742	1.00E-01	I									3.7E+03	N		3.7E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N				2.5E+02		5.0E+03	N	
DICAMBA	1918009	3.00E-02	I									1.1E+03	N		1.1E+02	N		4.1E+01	N		6.1E+04	N		2.3E+03	N				2.2E-01		4.5E+00	N	
**1,2-DICHLOROBENZENE	95501	9.00E-02	I							y		5.5E+02	N		3.3E+02	N		1.2E+02	N		1.8E+05	N		7.0E+03	N				4.6E-01		9.3E+00	N	
1,3-DICHLOROBENZENE	541731	9.00E-04	E							y		5.5E+00	N		3.3E+00	N		1.2E+00	N		1.8E+03	N		7.0E+01	N				4.4E-03		8.7E-02	N	

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											Tap		Ambient				Soil					Soil, for groundwater migration		
		RfDo		CSFo		RfDi		CSFi			water		air		Fish		Industrial		Residential			DAF 1	DAF 20	
Chemical	CAS	mg/kg/d		1/mg/kg/d		mg/kg/d		1/mg/kg/d		VOC	ug/l		ug/m3		mg/kg		mg/kg		mg/kg			mg/kg	mg/kg	
1,4-DICHLOROBENZENE	106467	3.00E-02	E	2.40E-02	H	2.29E-01	I	2.2E-02	E	y	4.7E-01	C	2.8E-01	C	1.3E-01	C	2.4E+02	C	2.7E+01	C		3.6E-04	7.1E-03	C
3,3'-DICHLOROBENZIDINE	91941			4.50E-01	I						1.5E-01	C	1.4E-02	C	7.0E-03	C	1.3E+01	C	1.4E+00	C		2.5E-04	4.9E-03	C
1,4-DICHLORO-2-BUTENE	764410							9.30E+00	H	y	1.3E-03	C	6.7E-04	C								4.0E-07	8.0E-06	C
DICHLORODIFLUOROMETHANE	75718	2.00E-01	I			5.00E-02	A			y	3.5E+02	N	1.8E+02	N	2.7E+02	N	4.1E+05	N	1.6E+04	N		5.5E-01	1.1E+01	N
1,1-DICHLOROETHANE	75343	1.00E-01	H			1.40E-01	A			y	8.0E+02	N	5.1E+02	N	1.4E+02	N	2.0E+05	N	7.8E+03	N		2.3E-01	4.5E+00	N
1,2-DICHLOROETHANE	107062	3.00E-02	E	9.10E-02	I	1.40E-03	E	9.10E-02	I	y	1.2E-01	C	6.9E-02	C	3.5E-02	C	6.3E+01	C	7.0E+00	C		5.2E-05	1.0E-03	C
1,1-DICHLOROETHENE	75354	9.00E-03	I	6.00E-01	I			1.75E-01	I	y	4.4E-02	C	3.6E-02	C	5.3E-03	C	9.5E+00	C	1.1E+00	C		1.8E-05	3.6E-04	C
CIS-1,2-DICHLOROETHENE	156592	1.00E-02	H							y	6.1E+01	N	3.7E+01	N	1.4E+01	N	2.0E+04	N	7.8E+02	N		1.7E-02	3.5E-01	N
TRANS-1,2-DICHLOROETHENE	156605	2.00E-02	I							y	1.2E+02	N	7.3E+01	N	2.7E+01	N	4.1E+04	N	1.6E+03	N		4.1E-02	8.2E-01	N
TOTAL 1,2-DICHLOROETHENE	540590	9.00E-03	H							y	5.5E+01	N	3.3E+01	N	1.2E+01	N	1.8E+04	N	7.0E+02	N		1.9E-02	3.7E-01	N
2,4-DICHLOROPHENOL	120832	3.00E-03	I								1.1E+02	N	1.1E+01	N	4.1E+00	N	6.1E+03	N	2.3E+02	N		6.0E-02	1.2E+00	N
2,4-D	94757	1.00E-02	I								3.7E+02	N	3.7E+01	N	1.4E+01	N	2.0E+04	N	7.8E+02	N		4.5E-01	9.0E+00	N
4-(2,4-DICHLOROPHENOXY)BUTYRIC ACI	94826	8E-03	I								2.9E+02	N	2.9E+01	N	1.1E+01	N	1.6E+04	N	6.3E+02	N				
1,2-DICHLOROPROPANE	78875			6.80E-02	H	1.14E-03	I			y	1.6E-01	C	9.2E-02	C	4.6E-02	C	8.4E+01	C	9.4E+00	C		1.0E-04	2.1E-03	C
2,3-DICHLOROPROPANOL	616239	3.00E-03	I								1.1E+02	N	1.1E+01	N	4.1E+00	N	6.1E+03	N	2.3E+02	N				
1,3-DICHLOROPROPENE	542756	3.00E-04	I	1.80E-01	H	5.71E-03	I	1.30E-01	H	y	7.7E-02	C	4.8E-02	C	1.8E-02	C	3.2E+01	C	3.5E+00	C	!	2.7E-05	5.5E-04	C
DICHLORVOS	62737	5E-04	I	0.29	I	1.43E-04	I				2.3E-01	C	2.2E-02	C	1.1E-02	C	2.0E+01	C	2.2E+00	C		5.5E-05	1.1E-03	C
DICOFOL	115322			4.4E-01	W						1.5E-01	C	1.4E-02	C	7.2E-03	C	1.3E+01	C	1.5E+00	C		9.3E-04	1.9E-02	C
DICYCLOPENTADIENE	77736	3E-02	H			6.00E-05	A			y	4.4E-01	N	2.2E-01	N	4.1E+01	N	6.1E+04	N	2.3E+03	N				
DIELDRIN	60571	5.00E-05	I	1.60E+01	I			1.60E+01	I		4.2E-03	C	3.9E-04	C	2.0E-04	C	3.6E-01	C	4.0E-02	C		1.1E-04	2.2E-03	C
DIESEL EMISSIONS						1.40E-03	I						5.1E+00	N										
DIETHYLPHTHALATE	84662	8.00E-01	I								2.9E+04	N	2.9E+03	N	1.1E+03	N	1.6E+06	N	6.3E+04	N		2.3E+01	4.5E+02	N
DIETHYLENE GLYCOL, MONOBUTYL ETH	112345					5.70E-03	H						2.1E+01	N										
DIETHYLENE GLYCOL, MONOETHYL ETH	111900	2.00E+00	H								7.3E+04	N	7.3E+03	N	2.7E+03	N	4.1E+06	N	1.6E+05	N				
DI(2-ETHYLHEXYL)ADIPATE	103231	6.00E-01	I	1.20E-03	I						5.6E+01	C	5.2E+00	C	2.6E+00	C	4.8E+03	C	5.3E+02	C				
DIETHYLSTILBESTROL	56531			4.70E+03	H						1.4E-05	C	1.3E-06	C	6.7E-07	C	1.2E-03	C	1.4E-04	C				
DIFENZOQUAT (AVENGE)	4.3E+07	8.00E-02	I								2.9E+03	N	2.9E+02	N	1.1E+02	N	1.6E+05	N	6.3E+03	N				
1,1-DIFLUOROETHANE	75376					#######	I			y	8.0E+04	N	4.0E+04	N										
DIISOPROPYL METHYLPHOSPHONATE (D	1445756	8.00E-02	I								2.9E+03	N	2.9E+02	N	1.1E+02	N	1.6E+05	N	6.3E+03	N				
3,3'-DIMETHOXYBENZIDINE	119904			1.40E-02	H						4.8E+00	C	4.5E-01	C	2.3E-01	C	4.1E+02	C	4.6E+01	C				
DIMETHYLAMINE	124403					5.70E-06	W			y	4.2E-02	N	2.1E-02	N								8.5E-06	1.7E-04	N
2,4-DIMETHYLANILINE HYDROCHLORIDE	2.1E+07			5.80E-01	H						1.2E-01	C	1.1E-02	C	5.4E-03	C	9.9E+00	C	1.1E+00	C				
2,4-DIMETHYLANILINE	95681			7.50E-01	H						8.9E-02	C	8.3E-03	C	4.2E-03	C	7.6E+00	C	8.5E-01	C				
N,N-DIMETHYLANILINE	121697	2.00E-03	I								7.3E+01	N	7.3E+00	N	2.7E+00	N	4.1E+03	N	1.6E+02	N				
3,3'-DIMETHYLBENZIDINE	119937			9.20E+00	H						7.3E-03	C	6.8E-04	C	3.4E-04	C	6.2E-01	C	6.9E-02	C				
1,1-DIMETHYLHYDRAZINE	57147			2.60E+00	W			3.50E+00	W		2.6E-02	C	1.8E-03	C	1.2E-03	C	2.2E+00	C	2.5E-01	C				
1,2-DIMETHYLHYDRAZINE	540738			3.70E+01	W			3.70E+01	W		1.8E-03	C	1.7E-04	C	8.5E-05	C	1.5E-01	C	1.7E-02	C				
2,4-DIMETHYLPHENOL	105679	2.00E-02	I								7.3E+02	N	7.3E+01	N	2.7E+01	N	4.1E+04	N	1.6E+03	N		3.4E-01	6.7E+00	N
2,6-DIMETHYLPHENOL	576261	6.00E-04	I								2.2E+01	N	2.2E+00	N	8.1E-01	N	1.2E+03	N	4.7E+01	N				
3,4-DIMETHYLPHENOL	95658	1.00E-03	I								3.7E+01	N	3.7E+00	N	1.4E+00	N	2.0E+03	N	7.8E+01	N				
DIMETHYLPHTHALATE	131113	1.00E+01	W								3.7E+05	N	3.7E+04	N	1.4E+04	N	2.0E+07	N	7.8E+05	N				
1,2-DINITROBENZENE	528290	4.00E-04	H								1.5E+01	N	1.5E+00	N	5.4E-01	N	8.2E+02	N	3.1E+01	N				
1,3-DINITROBENZENE	99650	1.00E-04	I								3.7E+00	N	3.7E-01	N	1.4E-01	N	2.0E+02	N	7.8E+00	N		1.8E-03	3.7E-02	N

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		RfDo		CSFo		RfDi		CSFi		VOC		water			air			Fish			Industrial			Residential			DAF 1		DAF 20			
Chemical	CAS	mg/kg/d		1/mg/kg/d		mg/kg/d		1/mg/kg/d				ug/l			ug/m3			mg/kg			mg/kg			mg/kg			mg/kg		mg/kg			
1,4-DINITROBENZENE	100254	4.00E-04	H									1.5E+01	N		1.5E+00	N		5.4E-01	N		8.2E+02	N		3.1E+01	N							
4,6-DINITRO-O-CYCLOHEXYL PHENOL	131895	2.00E-03	I									7.3E+01	N		7.3E+00	N		2.7E+00	N		4.1E+03	N		1.6E+02	N							
4,6-DINITRO-2-METHYLPHENOL	534521	1.00E-04	E									3.7E+00	N		3.7E-01	N		1.4E-01	N		2.0E+02	N		7.8E+00	N							
2,4-DINITROPHENOL	51285	2.00E-03	I									7.3E+01	N		7.3E+00	N		2.7E+00	N		4.1E+03	N		1.6E+02	N							
DINITROTOLUENE MIX				6.80E-01	I							9.8E-02	C		9.2E-03	C		4.6E-03	C		8.4E+00	C		9.4E-01	C							
2,4-DINITROTOLUENE	121142	2.00E-03	I									7.3E+01	N		7.3E+00	N		2.7E+00	N		4.1E+03	N		1.6E+02	N		2.9E-02		5.7E-01		N	
2,6-DINITROTOLUENE	606202	1.00E-03	H									3.7E+01	N		3.7E+00	N		1.4E+00	N		2.0E+03	N		7.8E+01	N		1.2E-02		2.5E-01		N	
DINOSEB	88857	1.00E-03	I									3.7E+01	N		3.7E+00	N		1.4E+00	N		2.0E+03	N		7.8E+01	N		8.7E-03		1.7E-01		N	
DIOCTYLPHTHALATE	117840	2.00E-02	H									7.3E+02	N		7.3E+01	N		2.7E+01	N		4.1E+04	N		1.6E+03	N		1.2E+05		2.4E+06		N	
1,4-DIOXANE	123911			1.10E-02	I							6.1E+00	C		5.7E-01	C		2.9E-01	C		5.2E+02	C		5.8E+01	C		1.3E-03		2.6E-02		C	
DIPHENYLAMINE	122394	2.50E-02	I									9.1E+02	N		9.1E+01	N		3.4E+01	N		5.1E+04	N		2.0E+03	N		1.3E+00		2.5E+01		N	
1,2-DIPHENYLHYDRAZINE	122667			8.00E-01	I			8.00E-01	I			8.4E-02	C		7.8E-03	C		3.9E-03	C		7.2E+00	C		8.0E-01	C		1.3E-04		2.5E-03		C	
DIQUAT	85007	2.20E-03	I									8.0E+01	N		8.0E+00	N		3.0E+00	N		4.5E+03	N		1.7E+02	N		1.7E-02		3.3E-01		N	
DISULFOTON	298044	4.00E-05	I									1.5E+00	N		1.5E-01	N		5.4E-02	N		8.2E+01	N		3.1E+00	N		3.2E-03		6.4E-02		N	
1,4-DITHIANE	505293	1.00E-02	I									3.7E+02	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N							
DIURON	330541	2.00E-03	I									7.3E+01	N		7.3E+00	N		2.7E+00	N		4.1E+03	N		1.6E+02	N		5.8E-02		1.2E+00		N	
ENDOSULFAN	115297	6.00E-03	I									2.2E+02	N		2.2E+01	N		8.1E+00	N		1.2E+04	N		4.7E+02	N		9.8E-01		2.0E+01		N	
ENDRIN	72208	3.00E-04	I									1.1E+01	N		1.1E+00	N		4.1E-01	N		6.1E+02	N		2.3E+01	N		2.7E-01		5.4E+00		N	
EPICHLOROHYDRIN	106898	2.00E-03	H	9.90E-03	I	2.86E-04	I	4.20E-03	I	y		2.0E+00	N		1.0E+00	N		3.2E-01	C		5.8E+02	C	!	6.5E+01	C	!	4.2E-04		8.4E-03		N	
ETHION	563122	5.00E-04	I									1.8E+01	N		1.8E+00	N		6.8E-01	N		1.0E+03	N		3.9E+01	N		3.2E-01		6.4E+00		N	
2-ETHOXYETHANOL	110805	4.00E-01	H			5.70E-02	I					1.5E+04	N		2.1E+02	N		5.4E+02	N		8.2E+05	N		3.1E+04	N		3.3E+00		6.5E+01		N	
ETHYL ACETATE	141786	9.00E-01	I							y		5.5E+03	N		3.3E+03	N		1.2E+03	N		1.8E+06	N		7.0E+04	N		1.7E+00		3.5E+01		N	
ETHYLBENZENE	100414	1.00E-01	I			2.90E-01	I			y		1.3E+03	N		1.1E+03	N		1.4E+02	N		2.0E+05	N		7.8E+03	N		7.5E-01		1.5E+01		N	
ETHYLENE DIAMINE	107153	2.00E-02	H									7.3E+02	N		7.3E+01	N		2.7E+01	N		4.1E+04	N		1.6E+03	N							
ETHYLENE GLYCOL	107211	2.00E+00	I									7.3E+04	N		7.3E+03	N		2.7E+03	N		4.1E+06	N		1.6E+05	N		1.5E+01		3.0E+02		N	
ETHYLENE GLYCOL, MONOBUTYL ETHER	111762					5.70E-03	H								2.1E+01	N																
ETHYLENE OXIDE	75218			1.00E+00	H			3.50E-01	H	y		2.3E-02	C		1.8E-02	C		3.2E-03	C		5.7E+00	C		6.4E-01	C		4.8E-06		9.5E-05		C	
ETHYLENE THIOUREA	96457	8.00E-05	I	1.1E-01	H							6.1E-01	C	!	5.7E-02	C	!	2.9E-02	C	!	5.2E+01	C	!	5.8E+00	C	!						
ETHYL ETHER	60297	2.00E-01	I							y		1.2E+03	N		7.3E+02	N		2.7E+02	N		4.1E+05	N		1.6E+04	N		4.2E-01		8.5E+00		N	
ETHYL METHACRYLATE	97632	9.00E-02	H							y		5.5E+02	N		3.3E+02	N		1.2E+02	N		1.8E+05	N		7.0E+03	N		1.0E+00		2.1E+01		N	
FENAMIPHOS	2.2E+07	2.50E-04	I									9.1E+00	N		9.1E-01	N		3.4E-01	N		5.1E+02	N		2.0E+01	N		7.8E-03		1.6E-01		N	
FLUOMETURON	2164172	1.30E-02	I									4.7E+02	N		4.7E+01	N		1.8E+01	N		2.7E+04	N		1.0E+03	N							
FLUORINE	7782414	6.00E-02	I									2.2E+03	N		2.2E+02	N		8.1E+01	N		1.2E+05	N		4.7E+03	N							
FOMESAFEN	7.2E+07			1.90E-01	I							3.5E-01	C		3.3E-02	C		1.7E-02	C		3.0E+01	C		3.4E+00	C							
FONOFOS	944229	2.00E-03	I									7.3E+01	N		7.3E+00	N		2.7E+00	N		4.1E+03	N		1.6E+02	N		1.8E-01		3.5E+00		N	
FORMALDEHYDE	50000	2.00E-01	I					4.50E-02	I			7.3E+03	N		1.4E-01	C		2.7E+02	N		4.1E+05	N		1.6E+04	N		1.5E+00		3.0E+01		N	
FORMIC ACID	64186	2.00E+00	H									7.3E+04	N		7.3E+03	N		2.7E+03	N		4.1E+06	N		1.6E+05	N							
FURAN	110009	1.00E-03	I							y		6.1E+00	N		3.7E+00	N		1.4E+00	N		2.0E+03	N		7.8E+01	N		1.5E-03		3.0E-02		N	
FURAZOLIDONE	67458			3.80E+00	H							1.8E-02	C		1.6E-03	C		8.3E-04	C		1.5E+00	C		1.7E-01	C							
FURFURAL	98011	3.00E-03	I			1.00E-02	A					1.1E+02	N		3.7E+01	N		4.1E+00	N		6.1E+03	N		2.3E+02	N		2.3E-02		4.6E-01		N	
GLYCIDALDEHYDE	765344	4.00E-04	I			2.90E-04	H					1.5E+01	N		1.1E+00	N		5.4E-01	N		8.2E+02	N		3.1E+01	N							
GLYPHOSATE	1071836	1.00E-01	I									3.7E+03	N		3.7E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N		2.6E+01		5.3E+02		N	
HEPTACHLOR	76448	5.00E-04	I	4.50E+00	I			4.50E+00	I			1.5E-02	C		1.4E-03	C		7.0E-04	C		1.3E+00	C		1.4E-01	C		4.2E-02		8.4E-01		C	

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												Tap			Ambient						Soil									Soil, for groundwater migration		
		RfDo		CSFo		RfDi		CSFi		VOC		water			air			Fish			Industrial			Residential			DAF 1		DAF 20		
Chemical	CAS	mg/kg/d		1/mg/kg/d		mg/kg/d		1/mg/kg/d				ug/l			ug/m3			mg/kg			mg/kg			mg/kg			mg/kg		mg/kg		
HEPTACHLOR EPOXIDE	1024573	1.30E-05	I	9.10E+00	I			9.10E+00	I			7.4E-03	C		6.9E-04	C		3.5E-04	C		6.3E-01	C		7.0E-02	C		1.2E-03		2.5E-02	C	
HEXABROMOBENZENE	87821	2.00E-03	I									7.3E+01	N		7.3E+00	N		2.7E+00	N		4.1E+03	N		1.6E+02	N						
HEXACHLOROBENZENE	118741	8.00E-04	I	1.60E+00	I			1.60E+00	I			4.2E-02	C		3.9E-03	C		2.0E-03	C		3.6E+00	C		4.0E-01	C		2.6E-03		5.2E-02	C	
HEXACHLOROBUTADIENE	87683	2.00E-04	H	7.80E-02	I			7.80E-02	I			8.6E-01	C	!	8.0E-02	C	!	4.0E-02	C	!	7.3E+01	C	!	8.2E+00	C	!	9.2E-02		1.8E+00	C	
ALPHA-HCH	319846			6.30E+00	I			6.30E+00	I			1.1E-02	C		9.9E-04	C		5.0E-04	C		9.1E-01	C		1.0E-01	C		4.5E-05		8.9E-04	C	
BETA-HCH	319857			1.80E+00	I			1.80E+00	I			3.7E-02	C		3.5E-03	C		1.8E-03	C		3.2E+00	C		3.5E-01	C		1.6E-04		3.1E-03	C	
GAMMA-HCH (LINDANE)	58899	3.00E-04	I	1.30E+00	H							5.2E-02	C		4.8E-03	C		2.4E-03	C		4.4E+00	C		4.9E-01	C		2.2E-04		4.3E-03	C	
TECHNICAL HCH	608731			1.80E+00	I			1.80E+00	I			3.7E-02	C		3.5E-03	C		1.8E-03	C		3.2E+00	C		3.5E-01	C						
HEXACHLOROCYCLOPENTADIENE	77474	7.00E-03	I			2.00E-05	H					2.6E+02	N		7.3E-02	N		9.5E+00	N		1.4E+04	N		5.5E+02	N		1.0E+02		2.0E+03	N	
HEXACHLORODIBENZODIOXIN MIX	1.9E+07			6.20E+03	I			4.55E+03	I			1.1E-05	C		1.4E-06	C		5.1E-07	C		9.2E-04	C		1.0E-04	C						
HEXACHLOROETHANE	67721	1.00E-03	I	1.40E-02	I			1.40E-02	I			4.8E+00	C	!	4.5E-01	C	!	2.3E-01	C	!	4.1E+02	C	!	4.6E+01	C	!	1.8E-02		3.6E-01	C	
HEXACHLOROPHENE	70304	3.00E-04	I									1.1E+01	N		1.1E+00	N		4.1E-01	N		6.1E+02	N		2.3E+01	N		1.0E+02		2.0E+03	N	
1,6-HEXAMETHYLENE DIISOCYANATE	822060					2.90E-06	I								1.1E-02	N															
HEXANE	110543	6.00E-02	H			5.71E-02	I			y		3.5E+02	N		2.1E+02	N		8.1E+01	N		1.2E+05	N		4.7E+03	N		6.9E-01		1.4E+01	N	
2-HEXANONE	591786	4.00E-02	E			1.4E-03	E					1.5E+03	N		5.1E+00	N		5.4E+01	N		8.2E+04	N		3.1E+03	N						
HEXAZINONE	5.1E+07	3.30E-02	I									1.2E+03	N		1.2E+02	N		4.5E+01	N		6.7E+04	N		2.6E+03	N						
HMX	2691410	5.00E-02	I									1.8E+03	N		1.8E+02	N		6.8E+01	N		1.0E+05	N		3.9E+03	N						
HYDRAZINE	302012			3.00E+00	I			1.70E+01	I			2.2E-02	C		3.7E-04	C		1.1E-03	C		1.9E+00	C		2.1E-01	C						
HYDROGEN CHLORIDE	7647010					5.70E-03	I								2.1E+01	N															
HYDROGEN SULFIDE	7783064	3.00E-03	I			2.85E-04	I					1.1E+02	N		1.0E+00	N		4.1E+00	N		6.1E+03	N		2.3E+02	N						
HYDROQUINONE	123319	4.00E-02	H									1.5E+03	N		1.5E+02	N		5.4E+01	N		8.2E+04	N		3.1E+03	N						
IRON	7439896	3.00E-01	E									1.1E+04	N		1.1E+03	N		4.1E+02	N		6.1E+05	N		2.3E+04	N						
ISOBUTANOL	78831	3.00E-01	I							y		1.8E+03	N		1.1E+03	N		4.1E+02	N		6.1E+05	N		2.3E+04	N		5.9E-01		1.2E+01	N	
ISOPHORONE	78591	2.00E-01	I	9.50E-04	I							7.0E+01	C		6.6E+00	C		3.3E+00	C		6.0E+03	C		6.7E+02	C		2.1E-02		4.1E-01	C	
ISOPROPALIN	3.4E+07	1.50E-02	I									5.5E+02	N		5.5E+01	N		2.0E+01	N		3.1E+04	N		1.2E+03	N						
ISOPROPYL METHYL PHOSPHONIC ACID	1832548	1.00E-01	I									3.7E+03	N		3.7E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N						
TETRAETHYLLEAD	78002	1.00E-07	I									3.7E-03	N		3.7E-04	N		1.4E-04	N		2.0E-01	N		7.8E-03	N		4.6E-05		9.2E-04	N	
LITHIUM	7439932	2.00E-02	E									7.3E+02	N		7.3E+01	N		2.7E+01	N		4.1E+04	N		1.6E+03	N						
MALATHION	121755	2.00E-02	I									7.3E+02	N		7.3E+01	N		2.7E+01	N		4.1E+04	N		1.6E+03	N		4.0E-01		8.1E+00	N	
MALEIC ANHYDRIDE	108316	1.00E-01	I									3.7E+03	N		3.7E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N						
MANGANESE-NONFOOD	7439965	2.00E-02	I			1.43E-05	I					7.3E+02	N		5.2E-02	N		2.7E+01	N		4.1E+04	N		1.6E+03	N		4.8E+01		9.5E+02	N	
MANGANESE-FOOD	7439965	1.40E-01	I			1.43E-05	I					5.1E+03	N		5.2E-02	N		1.9E+02	N		2.9E+05	N		1.1E+04	N		3.3E+02		6.7E+03	N	
MEPHOSFOLAN	950107	9.00E-05	H									3.3E+00	N		3.3E-01	N		1.2E-01	N		1.8E+02	N		7.0E+00	N						
MEPIQUAT CHLORIDE	2.4E+07	3.00E-02	I									1.1E+03	N		1.1E+02	N		4.1E+01	N		6.1E+04	N		2.3E+03	N						
MERCURIC CHLORIDE	7487947	3.00E-04	I									1.1E+01	N		1.1E+00	N		4.1E-01	N		6.1E+02	N		2.3E+01	N						
MERCURY (INORGANIC)	7439976					8.60E-05	I								3.1E-01	N															
METHYLMERCURY	2.3E+07	1.00E-04	I									3.7E+00	N		3.7E-01	N		1.4E-01	N		2.0E+02	N		7.8E+00	N						
METHACRYLONITRILE	126987	1.00E-04	I			2.00E-04	A			y		1.0E+00	N		7.3E-01	N		1.4E-01	N		2.0E+02	N		7.8E+00	N		2.1E-04		4.2E-03	N	
METHANOL	67561	5.00E-01	I									1.8E+04	N		1.8E+03	N		6.8E+02	N		1.0E+06	N		3.9E+04	N		3.8E+00		7.5E+01	N	
METHIDATHION	950378	1.00E-03	I									3.7E+01	N		3.7E+00	N		1.4E+00	N		2.0E+03	N		7.8E+01	N						
METHOXYCHLOR	72435	5.00E-03	I									1.8E+02	N		1.8E+01	N		6.8E+00	N		1.0E+04	N		3.9E+02	N		1.5E+01		3.1E+02	N	
METHYL ACETATE	79209	1.00E+00	H							y		6.1E+03	N		3.7E+03	N		1.4E+03	N		2.0E+06	N		7.8E+04	N		1.2E+00		2.5E+01	N	
METHYL ACRYLATE	96333	3.00E-02	A							y		1.8E+02	N		1.1E+02	N		4.1E+01	N		6.1E+04	N		2.3E+03	N		5.0E-01		1.0E+01	N	

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		RfDo		CSFo		RfDi		CSFi				water			air			Fish		Industrial			Residential			DAF 1	DAF 20	
Chemical	CAS	mg/kg/d		1/mg/kg/d		mg/kg/d		1/mg/kg/d		VOC		ug/l			ug/m3			mg/kg		mg/kg			mg/kg			mg/kg	mg/kg	
2-METHYLANILINE	95534			2.40E-01	H							2.8E-01	C		2.6E-02	C		1.3E-02	C	2.4E+01	C		2.7E+00	C		2.8E-04	5.7E-03	C
4-(2-METHYL-4-CHLOROPHENOXY) BUTYI	94815	1.00E-02	I									3.7E+02	N		3.7E+01	N		1.4E+01	N	2.0E+04	N		7.8E+02	N				
2-METHYL-4-CHLOROPHENOXYACETIC A	94746	5.00E-04	I									1.8E+01	N		1.8E+00	N		6.8E-01	N	1.0E+03	N		3.9E+01	N				
2-(2-METHYL-4-CHLOROPHENOXY)PROPI	93652	1.00E-03	I									3.7E+01	N		3.7E+00	N		1.4E+00	N	2.0E+03	N		7.8E+01	N				
METHYLCYCLOHEXANE	108872					8.60E-01	H			y		6.3E+03	N		3.1E+03	N												
METHYLENE BROMIDE	74953	1.00E-02	A							y		6.1E+01	N		3.7E+01	N		1.4E+01	N	2.0E+04	N		7.8E+02	N		1.5E-02	3.0E-01	N
METHYLENE CHLORIDE	75092	6.00E-02	I	7.50E-03	I	8.60E-01	H	1.65E-03	I	y		4.1E+00	C		3.8E+00	C		4.2E-01	C	7.6E+02	C		8.5E+01	C		9.5E-04	1.9E-02	C
4,4'-METHYLENE BIS(2-CHLOROANILINE)	101144	7.00E-04	H	1.30E-01	H			1.30E-01	H			5.2E-01	C		4.8E-02	C		2.4E-02	C	4.4E+01	C		4.9E+00	C				
4,4'-METHYLENE BIS(N,N'-DIMETHYL)ANIL	101611			4.60E-02	I							1.5E+00	C		1.4E-01	C		6.9E-02	C	1.2E+02	C		1.4E+01	C				
4,4'-METHYLENEDIPHENYL ISOCYANATE	101688					1.7E-04	I								6.2E-01	N												
METHYL ETHYL KETONE (2-BUTANONE)	78933	6.00E-01	I			2.86E-01	I			y		1.9E+03	N		1.0E+03	N		8.1E+02	N	1.2E+06	N		4.7E+04	N		4.0E-01	7.9E+00	N
METHYL HYDRAZINE	60344			1.10E+00	W							6.1E-02	C		5.7E-03	C		2.9E-03	C	5.2E+00	C		5.8E-01	C				
METHYL ISOBUTYL KETONE (4-METHYL-2	108101	8.00E-02	H			2.00E-02	A			y		1.4E+02	N		7.3E+01	N		1.1E+02	N	1.6E+05	N		6.3E+03	N		6.5E-02	1.3E+00	N
METHYL METHACRYLATE	80626	1.40E+00	I			2.00E-01	I			y		1.4E+03	N		7.3E+02	N		1.9E+03	N	2.9E+06	N		1.1E+05	N		3.2E-01	6.5E+00	N
2-METHYL-5-NITROANILINE	99558			3.30E-02	H							2.0E+00	C		1.9E-01	C		9.6E-02	C	1.7E+02	C		1.9E+01	C				
METHYL PARATHION	298000	2.50E-04	I									9.1E+00	N		9.1E-01	N		3.4E-01	N	5.1E+02	N		2.0E+01	N		4.3E-03	8.5E-02	N
2-METHYLPHENOL	95487	5.00E-02	I									1.8E+03	N		1.8E+02	N		6.8E+01	N	1.0E+05	N		3.9E+03	N				
3-METHYLPHENOL	108394	5.00E-02	I									1.8E+03	N		1.8E+02	N		6.8E+01	N	1.0E+05	N		3.9E+03	N				
4-METHYLPHENOL	106445	5.00E-03	H									1.8E+02	N		1.8E+01	N		6.8E+00	N	1.0E+04	N		3.9E+02	N				
METHYLSTYRENE MIX	2.5E+07	6.00E-03	A			1.00E-02	A			y		5.5E+01	N		3.7E+01	N		8.1E+00	N	1.2E+04	N		4.7E+02	N		5.1E-02	1.0E+00	N
ALPHA-METHYLSTYRENE	98839	7.00E-02	A							y		4.3E+02	N		2.6E+02	N		9.5E+01	N	1.4E+05	N		5.5E+03	N		4.0E-01	7.9E+00	N
METHYL TERT-BUTYL ETHER	1634044					8.57E-01	I			y		6.3E+03	N		3.1E+03	N										1.4E+00	2.8E+01	N
METOLACHLOR (DUAL)	5.1E+07	1.50E-01	I									5.5E+03	N		5.5E+02	N		2.0E+02	N	3.1E+05	N		1.2E+04	N				
MIREX	2385855	2.00E-04	I									7.3E+00	N		7.3E-01	N		2.7E-01	N	4.1E+02	N		1.6E+01	N				
MOLYBDENUM	7439987	5E-03	I									1.8E+02	N		1.8E+01	N		6.8E+00	N	1.0E+04	N		3.9E+02	N				
MONOCHLORAMINE	1.1E+07	1E-01	I			1.00E-01	H					3.7E+03	N		3.7E+02	N		1.4E+02	N	2.0E+05	N		7.8E+03	N				
NALED	300765	2E-03	I									7.3E+01	N		7.3E+00	N		2.7E+00	N	4.1E+03	N		1.6E+02	N				
NICKEL REFINERY DUST								8.4E-01	I						7.5E-03	C												
NICKEL	7440020	2.00E-02	I									7.3E+02	N		7.3E+01	N		2.7E+01	N	4.1E+04	N		1.6E+03	N				
NITRATE	1.5E+07	1.60E+00	I									5.8E+04	N		5.8E+03	N		2.2E+03	N	3.3E+06	N		1.3E+05	N				
NITRIC OXIDE	1E+07	1.00E-01	W							y		6.1E+02	N		3.7E+02	N		1.4E+02	N	2.0E+05	N		7.8E+03	N				
NITRITE	1.5E+07	1.00E-01	I									3.7E+03	N		3.7E+02	N		1.4E+02	N	2.0E+05	N		7.8E+03	N				
2-NITROANILINE	88744					5.70E-05	H								2.1E-01	N												
NITROBENZENE	98953	5.00E-04	I			6.00E-04	A			y		3.5E+00	N		2.2E+00	N		6.8E-01	N	1.0E+03	N		3.9E+01	N		1.2E-03	2.3E-02	N
NITROFURANTOIN	67209	7.00E-02	H									2.6E+03	N		2.6E+02	N		9.5E+01	N	1.4E+05	N		5.5E+03	N				
NITROFURAZONE	59870			1.50E+00	H							4.5E-02	C		4.2E-03	C		2.1E-03	C	3.8E+00	C		4.3E-01	C				
NITROGEN DIOXIDE	1E+07	1.00E+00	W							y		6.1E+03	N		3.7E+03	N		1.4E+03	N	2.0E+06	N		7.8E+04	N				
NITROGLYCERIN	55630			1.4E-02	E							4.8E+00	C		4.5E-01	C		2.3E-01	C	4.1E+02	C		4.6E+01	C				
4-NITROPHENOL	100027	8.00E-03	E									2.9E+02	N		2.9E+01	N		1.1E+01	N	1.6E+04	N		6.3E+02	N		8.7E-02	1.7E+00	N
2-NITROPROPANE	79469					5.70E-03	I	9.40E+00	H	y		1.3E-03	C		6.7E-04	C										3.2E-07	6.4E-06	C
N-NITROSO-DI-N-BUTYLAMINE	924163			5.40E+00	I			5.60E+00	I	y		1.9E-03	C		1.1E-03	C		5.8E-04	C	1.1E+00	C		1.2E-01	C		1.4E-06	2.7E-05	C
N-NITROSODIETHANOLAMINE	1116547			2.80E+00	I							2.4E-02	C		2.2E-03	C		1.1E-03	C	2.0E+00	C		2.3E-01	C				
N-NITROSODIETHYLAMINE	55185			1.50E+02	I			1.50E+02	I			4.5E-04	C		4.2E-05	C		2.1E-05	C	3.8E-02	C		4.3E-03	C		1.1E-07	2.3E-06	C

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											Tap			Ambient						Soil						Soil, for groundwater migration		
		RfDo		CSFo		RfDi		CSFi			water			air			Fish			Industrial			Residential			DAF 1	DAF 20	
Chemical	CAS	mg/kg/d		1/mg/kg/d		mg/kg/d		1/mg/kg/d		VOC	ug/l			ug/m3			mg/kg			mg/kg			mg/kg			mg/kg	mg/kg	
N-NITROSODIMETHYLAMINE	62759			5.10E+01	I			5.10E+01	I		1.3E-03	C		1.2E-04	C		6.2E-05	C		1.1E-01	C		1.3E-02	C		2.8E-07	5.7E-06	C
N-NITROSODIPHENYLAMINE	86306			4.90E-03	I						1.4E+01	C		1.3E+00	C		6.4E-01	C		1.2E+03	C		1.3E+02	C		3.8E-02	7.6E-01	C
N-NITROSODIPROPYLAMINE	621647			7.00E+00	I						9.6E-03	C		8.9E-04	C		4.5E-04	C		8.2E-01	C		9.1E-02	C		2.4E-06	4.7E-05	C
N-NITROSO-N-ETHYLUREA	759739			1.40E+02	H						4.8E-04	C		4.5E-05	C		2.3E-05	C		4.1E-02	C		4.6E-03	C				
N-NITROSO-N-METHYLETHYLAMINE	1.1E+07			2.20E+01	I						3.0E-03	C		2.8E-04	C		1.4E-04	C		2.6E-01	C		2.9E-02	C				
N-NITROSOPYRROLIDINE	930552			2.10E+00	I			2.10E+00	I		3.2E-02	C		3.0E-03	C		1.5E-03	C		2.7E+00	C		3.0E-01	C				
M-NITROTOLUENE	99081	2.00E-02	E							y	1.2E+02	N		7.3E+01	N		2.7E+01	N		4.1E+04	N		1.6E+03	N				
O-NITROTOLUENE	88722	1.00E-02	H							y	6.1E+01	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N				
P-NITROTOLUENE	99990	1.00E-02	H							y	6.1E+01	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N				
NUSTAR	8.6E+07	7.00E-04	I								2.6E+01	N		2.6E+00	N		9.5E-01	N		1.4E+03	N		5.5E+01	N				
ORYZALIN	1.9E+07	5.00E-02	I								1.8E+03	N		1.8E+02	N		6.8E+01	N		1.0E+05	N		3.9E+03	N				
OXADIAZON	2E+07	5.00E-03	I								1.8E+02	N		1.8E+01	N		6.8E+00	N		1.0E+04	N		3.9E+02	N				
OXAMYL	2.3E+07	2.50E-02	I								9.1E+02	N		9.1E+01	N		3.4E+01	N		5.1E+04	N		2.0E+03	N		1.9E-01	3.8E+00	N
OXYFLUORFEN	4.3E+07	3.00E-03	I								1.1E+02	N		1.1E+01	N		4.1E+00	N		6.1E+03	N		2.3E+02	N				
PARAQUAT DICHLORIDE	1910425	4.50E-03	I								1.6E+02	N		1.6E+01	N		6.1E+00	N		9.2E+03	N		3.5E+02	N				
PARATHION	56382	6.00E-03	H								2.2E+02	N		2.2E+01	N		8.1E+00	N		1.2E+04	N		4.7E+02	N		5.0E-01	1.0E+01	N
PENTACHLOROBENZENE	608935	8.00E-04	I								2.9E+01	N		2.9E+00	N		1.1E+00	N		1.6E+03	N		6.3E+01	N		1.0E+00	2.0E+01	N
PENTACHLORONITROBENZENE	82688	3.00E-03	I	2.60E-01	H						2.6E-01	C		2.4E-02	C		1.2E-02	C		2.2E+01	C		2.5E+00	C		4.1E-03	8.2E-02	C
PENTACHLOROPHENOL	87865	3.00E-02	I	1.20E-01	I						5.6E-01	C		5.2E-02	C		2.6E-02	C		4.8E+01	C		5.3E+00	C				
PERMETHRIN	5.3E+07	5.00E-02	I								1.8E+03	N		1.8E+02	N		6.8E+01	N		1.0E+05	N		3.9E+03	N		1.2E+02	2.4E+03	N
PHENOL	108952	6.00E-01	I								2.2E+04	N		2.2E+03	N		8.1E+02	N		1.2E+06	N		4.7E+04	N		6.7E+00	1.3E+02	N
M-PHENYLENEDIAMINE	108452	6.00E-03	I								2.2E+02	N		2.2E+01	N		8.1E+00	N		1.2E+04	N		4.7E+02	N		4.9E-02	9.8E-01	N
O-PHENYLENEDIAMINE	95545			4.70E-02	H						1.4E+00	C		1.3E-01	C		6.7E-02	C		1.2E+02	C		1.4E+01	C				
P-PHENYLENEDIAMINE	106503	1.90E-01	H								6.9E+03	N		6.9E+02	N		2.6E+02	N		3.9E+05	N		1.5E+04	N				
2-PHENYLPHENOL	90437			1.90E-03	H						3.5E+01	C		3.3E+00	C		1.7E+00	C		3.0E+03	C		3.4E+02	C				
PHOSPHINE	7803512	3.00E-04	I			8.60E-05	I				1.1E+01	N		3.1E-01	N		4.1E-01	N		6.1E+02	N		2.3E+01	N				
PHOSPHORIC ACID	7664382					2.90E-03	I							1.1E+01	N													
PHOSPHORUS (WHITE)	7723140	2.00E-05	I								7.3E-01	N		7.3E-02	N		2.7E-02	N		4.1E+01	N		1.6E+00	N				
P-PHTHALIC ACID	100210	1.00E+00	H								3.7E+04	N		3.7E+03	N		1.4E+03	N		2.0E+06	N		7.8E+04	N				
PHTHALIC ANHYDRIDE	85449	2.00E+00	I			3.43E-02	H				7.3E+04	N		1.3E+02	N		2.7E+03	N		4.1E+06	N		1.6E+05	N		2.6E+01	5.2E+02	N
POLYBROMINATED BIPHENYLS		7.00E-06	H	8.90E+00	H						7.5E-03	C		7.0E-04	C		3.5E-04	C		6.4E-01	C		7.2E-02	C	!			
POLYCHLORINATED BIPHENYLS	1336363			2.00E+00	I			2.00E+00	I		3.3E-02	C		3.1E-03	C		1.6E-03	C		2.9E+00	C		3.2E-01	C		2.1E-02	4.1E-01	C
AROCLOR-1016	1.3E+07	7.00E-05	I	7.00E-02	I			7.00E-02	I		9.6E-01	C	!	8.9E-02	C	!	4.5E-02	C	!	8.2E+01	C	!	5.5E+00	N		2.1E-01	4.2E+00	C
AROCLOR-1221	1.1E+07			2.00E+00	I			2.00E+00	I		3.3E-02	C		3.1E-03	C		1.6E-03	C		2.9E+00	C		3.2E-01	C				
AROCLOR-1232	1.1E+07			2.00E+00	I			2.00E+00	I		3.3E-02	C		3.1E-03	C		1.6E-03	C		2.9E+00	C		3.2E-01	C				
AROCLOR-1242	5.3E+07			2.00E+00	I			2.00E+00	I		3.3E-02	C		3.1E-03	C		1.6E-03	C		2.9E+00	C		3.2E-01	C				
AROCLOR-1248	1.3E+07			2.00E+00	I			2.00E+00	I		3.3E-02	C		3.1E-03	C		1.6E-03	C		2.9E+00	C		3.2E-01	C				
AROCLOR-1254	1.1E+07	2.00E-05	I	2.00E+00	I			2.00E+00	I		3.3E-02	C		3.1E-03	C		1.6E-03	C		2.9E+00	C		3.2E-01	C	!	5.4E-02	1.1E+00	C
AROCLOR-1260	1.1E+07			2.00E+00	I			2.00E+00	I		3.3E-02	C		3.1E-03	C		1.6E-03	C		2.9E+00	C		3.2E-01	C				
POLYCHLORINATED TERPHENYLS	6.2E+07			4.50E+00	E						1.5E-02	C		1.4E-03	C		7.0E-04	C		1.3E+00	C		1.4E-01	C				
POLYNUCLEAR AROMATIC HYDROCARBONS:																												
ACENAPHTHENE	83329	6.00E-02	I							y	3.7E+02	N		2.2E+02	N		8.1E+01	N		1.2E+05	N		4.7E+03	N		5.2E+00	1.0E+02	N
ANTHRACENE	120127	3.00E-01	I							y	1.8E+03	N		1.1E+03	N		4.1E+02	N		6.1E+05	N		2.3E+04	N		2.3E+01	4.7E+02	N

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		RfDo		CSFo		RfDi		CSFi		VOC		water			air			Fish		Industrial			Residential			DAF 1	DAF 20	
Chemical	CAS	mg/kg/d		1/mg/kg/d		mg/kg/d		1/mg/kg/d				ug/l			ug/m3			mg/kg		mg/kg			mg/kg			mg/kg	mg/kg	
BENZ[A]ANTHRACENE	56553			7.30E-01	E							9.2E-02	C		8.6E-03	C		4.3E-03	C	7.8E+00	C		8.7E-01	C		7.3E-02	1.5E+00	C
BENZO[B]FLUORANTHENE	205992			7.30E-01	E							9.2E-02	C		8.6E-03	C		4.3E-03	C	7.8E+00	C		8.7E-01	C		2.3E-01	4.5E+00	C
BENZO[K]FLUORANTHENE	207089			7.30E-02	E							9.2E-01	C		8.6E-02	C		4.3E-02	C	7.8E+01	C		8.7E+00	C		2.3E+00	4.5E+01	C
BENZO[A]PYRENE	50328			7.30E+00	I			3.10E+00	E			9.2E-03	C		2.0E-03	C		4.3E-04	C	7.8E-01	C		8.7E-02	C		1.9E-02	3.7E-01	C
CARBAZOLE	86748			2.00E-02	H							3.3E+00	C		3.1E-01	C		1.6E-01	C	2.9E+02	C		3.2E+01	C		2.3E-02	4.7E-01	C
CHRYSENE	218019			7.30E-03	E							9.2E+00	C		8.6E-01	C		4.3E-01	C	7.8E+02	C		8.7E+01	C		7.3E+00	1.5E+02	C
DIBENZ[A,H]ANTHRACENE	53703			7.30E+00	E							9.2E-03	C		8.6E-04	C		4.3E-04	C	7.8E-01	C		8.7E-02	C		7.0E-02	1.4E+00	C
DIBENZOFURAN	132649	4.00E-03	E							y		2.4E+01	N		1.5E+01	N		5.4E+00	N	8.2E+03	N		3.1E+02	N		3.8E-01	7.7E+00	N
FLUORANTHENE	206440	4.00E-02	I									1.5E+03	N		1.5E+02	N		5.4E+01	N	8.2E+04	N		3.1E+03	N		3.1E+02	6.3E+03	N
FLUORENE	86737	4.00E-02	I							y		2.4E+02	N		1.5E+02	N		5.4E+01	N	8.2E+04	N		3.1E+03	N		6.8E+00	1.4E+02	N
INDENO[1,2,3-C,D]PYRENE	193395			7.30E-01	E							9.2E-02	C		8.6E-03	C		4.3E-03	C	7.8E+00	C		8.7E-01	C		6.4E-01	1.3E+01	C
2-METHYLNAPHTHALENE	91576	2.00E-02	E							y		1.2E+02	N		7.3E+01	N		2.7E+01	N	4.1E+04	N		1.6E+03	N		1.1E+00	2.2E+01	N
NAPHTHALENE	91203	2.00E-02	I			9.00E-04	I			y		6.5E+00	N		3.3E+00	N		2.7E+01	N	4.1E+04	N		1.6E+03	N		7.7E-03	1.5E-01	N
PYRENE	129000	3.00E-02	I							y		1.8E+02	N		1.1E+02	N		4.1E+01	N	6.1E+04	N		2.3E+03	N		3.4E+01	6.8E+02	N
PROMETON	1610180	1.50E-02	I									5.5E+02	N		5.5E+01	N		2.0E+01	N	3.1E+04	N		1.2E+03	N				
PROMETRYN	7287196	4.00E-03	I									1.5E+02	N		1.5E+01	N		5.4E+00	N	8.2E+03	N		3.1E+02	N				
PROPACHLOR	1918167	1.30E-02	I									4.7E+02	N		4.7E+01	N		1.8E+01	N	2.7E+04	N		1.0E+03	N				
PROPANIL	709988	5.00E-03	I									1.8E+02	N		1.8E+01	N		6.8E+00	N	1.0E+04	N		3.9E+02	N				
PROPARGITE	2312358	2.00E-02	I									7.3E+02	N		7.3E+01	N		2.7E+01	N	4.1E+04	N		1.6E+03	N				
N-PROPYLBENZENE		1.00E-02	E							y		6.1E+01	N		3.7E+01	N		1.4E+01	N	2.0E+04	N		7.8E+02	N		3.6E-01	7.1E+00	N
PROPYLENE GLYCOL	57556	2.00E+01	H									7.3E+05	N		7.3E+04	N		2.7E+04	N	4.1E+07	N		1.6E+06	N				
PROPYLENE GLYCOL, MONOETHYL ETHE	5.2E+07	7.00E-01	H									2.6E+04	N		2.6E+03	N		9.5E+02	N	1.4E+06	N		5.5E+04	N				
PROPYLENE GLYCOL, MONOMETHYL ETI	107982	7.00E-01	H			5.70E-01	I					2.6E+04	N		2.1E+03	N		9.5E+02	N	1.4E+06	N		5.5E+04	N				
PURSUIT	8.1E+07	2.50E-01	I									9.1E+03	N		9.1E+02	N		3.4E+02	N	5.1E+05	N		2.0E+04	N				
PYRIDINE	110861	1.00E-03	I									3.7E+01	N		3.7E+00	N		1.4E+00	N	2.0E+03	N		7.8E+01	N				
QUINOLINE	91225			1.20E+01	H							5.6E-03	C		5.2E-04	C		2.6E-04	C	4.8E-01	C		5.3E-02	C				
RDX	121824	3.00E-03	I	1.10E-01	I							6.1E-01	C		5.7E-02	C		2.9E-02	C	5.2E+01	C		5.8E+00	C				
RESMETHRIN	1E+07	3.00E-02	I									1.1E+03	N		1.1E+02	N		4.1E+01	N	6.1E+04	N		2.3E+03	N				
RONNEL	299843	5.00E-02	H									1.8E+03	N		1.8E+02	N		6.8E+01	N	1.0E+05	N		3.9E+03	N				
ROTENONE	83794	4.00E-03	I									1.5E+02	N		1.5E+01	N		5.4E+00	N	8.2E+03	N		3.1E+02	N				
SELENIOUS ACID	7783008	5.00E-03	I									1.8E+02	N		1.8E+01	N		6.8E+00	N	1.0E+04	N		3.9E+02	N				
SELENIUM	7782492	5.00E-03	I									1.8E+02	N		1.8E+01	N		6.8E+00	N	1.0E+04	N		3.9E+02	N		9.5E-01	1.9E+01	N
SILVER	7440224	5.00E-03	I									1.8E+02	N		1.8E+01	N		6.8E+00	N	1.0E+04	N		3.9E+02	N		1.6E+00	3.1E+01	N
SIMAZINE	122349	5.00E-03	I	1.20E-01	H							5.6E-01	C		5.2E-02	C		2.6E-02	C	4.8E+01	C		5.3E+00	C		1.7E-04	3.3E-03	C
SODIUM AZIDE	2.7E+07	4.00E-03	I									1.5E+02	N		1.5E+01	N		5.4E+00	N	8.2E+03	N		3.1E+02	N				
SODIUM DIETHYLDITHIOCARBAMATE	148185	3.00E-02	I	2.70E-01	H							2.5E-01	C		2.3E-02	C		1.2E-02	C	2.1E+01	C		2.4E+00	C				
STRONTIUM, STABLE	7440246	6.00E-01	I									2.2E+04	N		2.2E+03	N		8.1E+02	N	1.2E+06	N		4.7E+04	N		7.7E+02	1.5E+04	N
STRYCHNINE	57249	3.00E-04	I									1.1E+01	N		1.1E+00	N		4.1E-01	N	6.1E+02	N		2.3E+01	N		8.3E-03	1.7E-01	N
STYRENE	100425	2.00E-01	I			2.86E-01	I			y		1.6E+03	N		1.0E+03	N		2.7E+02	N	4.1E+05	N		1.6E+04	N		2.9E+00	5.7E+01	N
2,3,7,8-TETRACHLORODIBENZODIOXIN	1746016			1.50E+05	H			1.50E+05	H			4.5E-07	C		4.2E-08	C		2.1E-08	C	3.8E-05	C		4.3E-06	C		4.3E-07	8.6E-06	C
1,2,4,5-TETRACHLOROBENZENE	95943	3.00E-04	I									1.1E+01	N		1.1E+00	N		4.1E-01	N	6.1E+02	N		2.3E+01	N		3.3E-02	6.6E-01	N
1,1,1,2-TETRACHLOROETHANE	630206	3.00E-02	I	2.60E-02	I			2.60E-02	I	y		4.1E-01	C		2.4E-01	C		1.2E-01	C	2.2E+02	C		2.5E+01	C		2.0E-04	4.0E-03	C
1,1,2,2-TETRACHLOROETHANE	79345	6.00E-02	E	2.00E-01	I			2.00E-01	I	y		5.3E-02	C		3.1E-02	C		1.6E-02	C	2.9E+01	C		3.2E+00	C		3.4E-05	6.8E-04	C

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											Tap			Ambient					Soil						Soil, for groundwater migration		
		RfDo		CSFo		RfDi		CSFi			water			air			Fish			Industrial			Residential			DAF 1	DAF 20	
Chemical	CAS	mg/kg/d		1/mg/kg/d		mg/kg/d		1/mg/kg/d		VOC	ug/l			ug/m3			mg/kg			mg/kg			mg/kg			mg/kg	mg/kg	
TETRACHLOROETHENE	127184	1.00E-02	I	5.20E-02	E	1.4E-01	E	2.00E-03	E	y	1.1E+00	C		3.1E+00	C		6.1E-02	C		1.1E+02	C		1.2E+01	C		2.4E-03	4.8E-02	C
2,3,4,6-TETRACHLOROPHENOL	58902	3.00E-02	I								1.1E+03	N		1.1E+02	N		4.1E+01	N		6.1E+04	N		2.3E+03	N				
P,A,A,A-TETRACHLOROTOLUENE	5216251			2.00E+01	H						3.3E-03	C		3.1E-04	C		1.6E-04	C		2.9E-01	C		3.2E-02	C				
1,1,1,2-TETRAFLUOROETHANE	811972					#######	I			y	1.7E+05	N		8.4E+04	N													
**TETRAHYDROFURAN	109999	2.00E-01	E	7.6E-03	E	8.6E-02	E	6.8E-03	E		8.8E+00	C		9.2E-01	C		4.2E-01	C		7.5E+02	C		8.4E+01	C				
TETRYL	479458	1.00E-02	H								3.7E+02	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N				
THALLIC OXIDE	1314325	7.00E-05	W								2.6E+00	N		2.6E-01	N		9.5E-02	N		1.4E+02	N		5.5E+00	N				
THALLIUM	7440280	7.00E-05	O								2.6E+00	N		2.6E-01	N		9.5E-02	N		1.4E+02	N		5.5E+00	N		1.8E-01	3.6E+00	N
THALLIUM ACETATE	563688	9.00E-05	I								3.3E+00	N		3.3E-01	N		1.2E-01	N		1.8E+02	N		7.0E+00	N				
THALLIUM CARBONATE	6533739	8.00E-05	I								2.9E+00	N		2.9E-01	N		1.1E-01	N		1.6E+02	N		6.3E+00	N				
THALLIUM CHLORIDE	7791120	8.00E-05	I								2.9E+00	N		2.9E-01	N		1.1E-01	N		1.6E+02	N		6.3E+00	N				
THALLIUM NITRATE	1E+07	9.00E-05	I								3.3E+00	N		3.3E-01	N		1.2E-01	N		1.8E+02	N		7.0E+00	N				
THALLIUM SULFATE (2:1)	7446186	8.00E-05	I								2.9E+00	N		2.9E-01	N		1.1E-01	N		1.6E+02	N		6.3E+00	N				
THIOBENCARB	2.8E+07	1.00E-02	I								3.7E+02	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N				
TIN	7440315	6.00E-01	H								2.2E+04	N		2.2E+03	N		8.1E+02	N		1.2E+06	N		4.7E+04	N				
TITANIUM	7440326	4.00E+00	E			8.60E-03	E				1.5E+05	N		3.1E+01	N		5.4E+03	N		8.2E+06	N		3.1E+05	N				
TITANIUM DIOXIDE	1.3E+07	4.00E+00	E			8.60E-03	E				1.5E+05	N		3.1E+01	N		5.4E+03	N		8.2E+06	N		3.1E+05	N				
TOLUENE	108883	2.00E-01	I			1.14E-01	I			y	7.5E+02	N		4.2E+02	N		2.7E+02	N		4.1E+05	N		1.6E+04	N		4.4E-01	8.8E+00	N
TOLUENE-2,4-DIAMINE	95807			3.20E+00	H						2.1E-02	C		2.0E-03	C		9.9E-04	C		1.8E+00	C		2.0E-01	C				
TOLUENE-2,5-DIAMINE	95705	6.00E-01	H								2.2E+04	N		2.2E+03	N		8.1E+02	N		1.2E+06	N		4.7E+04	N				
TOLUENE-2,6-DIAMINE	823405	2.00E-01	H								7.3E+03	N		7.3E+02	N		2.7E+02	N		4.1E+05	N		1.6E+04	N				
P-TOLUIDINE	106490			1.90E-01	H						3.5E-01	C		3.3E-02	C		1.7E-02	C		3.0E+01	C		3.4E+00	C		3.0E-04	5.9E-03	C
TOXAPHENE	8001352			1.10E+00	I			1.10E+00	I		6.1E-02	C		5.7E-03	C		2.9E-03	C		5.2E+00	C		5.8E-01	C		3.1E-02	6.3E-01	C
1,2,4-TRIBROMOBENZENE	615543	5.00E-03	I								1.8E+02	N		1.8E+01	N		6.8E+00	N		1.0E+04	N		3.9E+02	N				
TRIBUTYLTIN OXIDE	56359	3.00E-04	I								1.1E+01	N		1.1E+00	N		4.1E-01	N		6.1E+02	N		2.3E+01	N				
2,4,6-TRICHLOROANILINE	634935			3.40E-02	H						2.0E+00	C		1.8E-01	C		9.3E-02	C		1.7E+02	C		1.9E+01	C				
1,2,4-TRICHLOROBENZENE	120821	1.00E-02	I			5.70E-02	H			y	1.9E+02	N		2.1E+02	N		1.4E+01	N		2.0E+04	N		7.8E+02	N		3.8E-01	7.5E+00	N
1,1,1-TRICHLOROETHANE	71556	2.00E-02	E			2.86E-01	E			y	5.4E+02	N		1.0E+03	N		2.7E+01	N		4.1E+04	N		1.6E+03	N		5.1E-01	1.0E+01	N
1,1,2-TRICHLOROETHANE	79005	4.00E-03	I	5.70E-02	I			5.60E-02	I	y	1.9E-01	C		1.1E-01	C		5.5E-02	C		1.0E+02	C		1.1E+01	C		3.9E-05	7.8E-04	C
TRICHLOROETHENE	79016	6.00E-03	E	1.10E-02	E			6.00E-03	E	y	1.6E+00	C		1.0E+00	C		2.9E-01	C		5.2E+02	C		5.8E+01	C	!	7.7E-04	1.5E-02	C
TRICHLOROFLUOROMETHANE	75694	3.00E-01	I			2.00E-01	A			y	1.3E+03	N		7.3E+02	N		4.1E+02	N		6.1E+05	N		2.3E+04	N		1.1E+00	2.3E+01	N
2,4,5-TRICHLOROPHENOL	95954	1.00E-01	I								3.7E+03	N		3.7E+02	N		1.4E+02	N		2.0E+05	N		7.8E+03	N				
2,4,6-TRICHLOROPHENOL	88062			1.10E-02	I			1.00E-02	I		6.1E+00	C		6.3E-01	C		2.9E-01	C		5.2E+02	C		5.8E+01	C				
2,4,5-T	93765	1.00E-02	I								3.7E+02	N		3.7E+01	N		1.4E+01	N		2.0E+04	N		7.8E+02	N		9.8E-02	2.0E+00	N
2-(2,4,5-TRICHLOROPHENOXY)PROPIONI	93721	8.00E-03	I								2.9E+02	N		2.9E+01	N		1.1E+01	N		1.6E+04	N		6.3E+02	N		1.1E+00	2.1E+01	N
1,1,2-TRICHLOROPROPANE	598776	5.00E-03	I							y	3.0E+01	N		1.8E+01	N		6.8E+00	N		1.0E+04	N		3.9E+02	N		1.2E-02	2.5E-01	N
1,2,3-TRICHLOROPROPANE	96184	6.00E-03	I	7.00E+00	H					y	1.5E-03	C		8.9E-04	C		4.5E-04	C		8.2E-01	C		9.1E-02	C		5.2E-07	1.0E-05	C
1,2,3-TRICHLOROPROPENE	96195	5.00E-03	H							y	3.0E+01	N		1.8E+01	N		6.8E+00	N		1.0E+04	N		3.9E+02	N		1.2E-02	2.5E-01	N
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHA	76131	3.00E+01	I			#######	H			y	5.9E+04	N		3.1E+04	N		4.1E+04	N		6.1E+07	N		2.3E+06	N		1.2E+02	2.3E+03	N
1,2,4-TRIMETHYLBENZENE	95636	5.00E-02	E			1.70E-03	E			y	1.2E+01	N		6.2E+00	N		6.8E+01	N		1.0E+05	N		3.9E+03	N				
1,3,5-TRIMETHYLBENZENE	108678	5.00E-02	E			1.70E-03	E			y	1.2E+01	N		6.2E+00	N		6.8E+01	N		1.0E+05	N		3.9E+03	N				
TRIMETHYL PHOSPHATE	512561			3.70E-02	H						1.8E+00	C		1.7E-01	C		8.5E-02	C		1.5E+02	C		1.7E+01	C				
1,3,5-TRINITROBENZENE	99354	3.00E-02	I								1.1E+03	N		1.1E+02	N		4.1E+01	N		6.1E+04	N		2.3E+03	N				

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Basis: C = Carcinogenic effects N = Noncarcinogenic effects ! = RBC at HI of 0.1 < RBC-c

Chemical	CAS	RfDo mg/kg/d		CSFo 1/mg/kg/d		RfDi mg/kg/d		CSFi 1/mg/kg/d		VOC	Risk-based concentrations: Tap water ug/l			Ambient air ug/m3			Fish mg/kg			Soil Industrial mg/kg			Soil Residential mg/kg			Region III SSLs, Soil, for groundwater migration: DAF 1 mg/kg	DAF 20 mg/kg	
2,4,6-TRINITROTOLUENE	118967	5.00E-04	I	3.00E-02	I						2.2E+00	C	!	2.1E-01	C	!	1.1E-01	C	!	1.9E+02	C	!	2.1E+01	C	!			
URANIUM (SOLUBLE SALTS)		3.00E-03	I								1.1E+02	N		1.1E+01	N		4.1E+00	N		6.1E+03	N		2.3E+02	N				
VANADIUM	7440622	7.00E-03	H								2.6E+02	N		2.6E+01	N		9.5E+00	N		1.4E+04	N		5.5E+02	N		2.6E+02	5.1E+03	N
VANADIUM PENTOXIDE	1314621	9.00E-03	I								3.3E+02	N		3.3E+01	N		1.2E+01	N		1.8E+04	N		7.0E+02	N				
VANADIUM SULFATE	1.7E+07	2.00E-02	H								7.3E+02	N		7.3E+01	N		2.7E+01	N		4.1E+04	N		1.6E+03	N				
VINCLOZOLIN	5E+07	2.50E-02	I								9.1E+02	N		9.1E+01	N		3.4E+01	N		5.1E+04	N		2.0E+03	N				
VINYL ACETATE	108054	1.00E+00	H			5.71E-02	I			y	4.1E+02	N		2.1E+02	N		1.4E+03	N		2.0E+06	N		7.8E+04	N		8.7E-02	1.7E+00	N
VINYL CHLORIDE	75014			1.90E+00	H			3.00E-01	H	y	1.9E-02	C		2.1E-02	C		1.7E-03	C		3.0E+00	C		3.4E-01	C		7.9E-06	1.6E-04	C
WARFARIN	81812	3.00E-04	I								1.1E+01	N		1.1E+00	N		4.1E-01	N		6.1E+02	N		2.3E+01	N		2.2E-02	4.4E-01	N
M-XYLENE	108383	2.00E+00	H							y	1.2E+04	N		7.3E+03	N		2.7E+03	N		4.1E+06	N		1.6E+05	N		1.3E+01	2.5E+02	N
O-XYLENE	95476	2.00E+00	H							y	1.2E+04	N		7.3E+03	N		2.7E+03	N		4.1E+06	N		1.6E+05	N		1.1E+01	2.3E+02	N
P-XYLENE	106423									y																		
XYLENES	1330207	2.00E+00	I							y	1.2E+04	N		7.3E+03	N		2.7E+03	N		4.1E+06	N		1.6E+05	N		8.5E+00	1.7E+02	N
ZINC	7440666	3.00E-01	I								1.1E+04	N		1.1E+03	N		4.1E+02	N		6.1E+05	N		2.3E+04	N		6.8E+02	1.4E+04	N
ZINC PHOSPHIDE	1314847	3E-04	I								1.1E+01	N		1.1E+00	N		4.1E-01	N		6.1E+02	N		2.3E+01	N				
ZINEB	1.2E+07	5E-02	I								1.8E+03	N		1.8E+02	N		6.8E+01	N		1.0E+05	N		3.9E+03	N				

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Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg·d/mg		CPSi kg·d/mg	
**ACETALDEHYDE	75070					2.57E-03	I	7.7E-03	I
ACETOCHLOR	34256821	2E-02	I						
**ACETONE	67641	1.00E-01	I						
ACETONITRILE	75058					1.7E-02	I		
ACETOPHENONE	98862	1.00E-01	I			5.70E-06	W		
ACROLEIN	107028	2.00E-02	H			5.70E-06	I		
ACRYLAMIDE	79061	2.00E-04	I	4.50E+00	I			4.50E+00	I
ACRYLONITRILE	107131	1.00E-03	H	5.40E-01	I	5.70E-04	I	2.40E-01	I
ALACHLOR	15972608	1.00E-02	I	8.00E-02	H				
ALAR	1596845	1.50E-01	I						
ALDICARB	116063	1.00E-03	I						
ALDICARB SULFONE	1646884	1.00E-03	I						
ALDRIN	309002	3.00E-05	I	1.70E+01	I			1.70E+01	I
ALUMINUM	7429905	1.00E+00	E			1.00E-03	E		
AMINODINITROTOLUENES		6.00E-05	E						
4-AMINOPYRIDINE	504245	2.00E-05	H						
**ANILINE	62533	7.00E-03	E	5.70E-03	I	2.90E-04	I		
ANTIMONY	7440360	4.00E-04	I						
ANTIMONY PENTOXIDE	1314609	5.00E-04	H						
ANTIMONY TETROXIDE	1332816	4.00E-04	H						
ANTIMONY TRIOXIDE	1309644	4.00E-04	H			5.70E-05	I		
ARSENIC	7440382	3.00E-04	I	1.50E+00	I			1.51E+01	I
ASSURE	76578148	9.00E-03	I						
ATRAZINE	1912249	3.50E-02	I	2.20E-01	H				
AZOBENZENE	103333			1.10E-01	I			1.10E-01	I
BARIUM	7440393	7.00E-02	I			1.40E-04	A		
BAYGON	114261	4.00E-03	I						
BAYTHROID	68359375	2.50E-02	I						
BENTAZON	25057890	3.00E-02	I						
BENZALDEHYDE	100527	1.00E-01	I						
BENZENE	71432	3.00E-03	E	2.90E-02	I	1.70E-03	E	2.90E-02	I
BENZENETHIOL	108985	1.00E-05	H						
BENZIDINE	92875	3.00E-03	I	2.30E+02	I			2.30E+02	I
BENZOIC ACID	65850	4.00E+00	I						
BENZYL ALCOHOL	100516	3.00E-01	H						
BENZYL CHLORIDE	100447			0.17	I				
BERYLLIUM	7440417	2.00E-03	I			5.7E-06	I	8.40E+00	I
BIPHENYL	92524	5.00E-02	I						
**BIS(2-CHLOROETHYL)ETHER	111444			1.10E+00	I			1.10E+00	I
BIS(2-CHLOROISOPROPYL)ETHER	108601	4.00E-02	I	7.00E-02	H			3.50E-02	H
**BIS(CHLOROMETHYL)ETHER	542881			2.20E+02	I			2.20E+02	I
**BIS(2-ETHYLHEXYL)PHTHALATE	117817	2.00E-02	I	1.40E-02	I			1.40E-02	E
**BORON	7440428	9.00E-02	I			5.70E-03	H		
BROMODICHLOROMETHANE	75274	2.00E-02	I	6.20E-02	I				
**BROMOFORM	75252	2.00E-02	I	7.90E-03	I			3.90E-03	I
**BROMOMETHANE	74839	1.40E-03	I			1.40E-03	I		
**BROMOPHOS	2104963	5.00E-03	H						
1-BUTANOL	71363	1.00E-01	I						
BUTYLBENZYLPHTHALATE	85687	2.00E-01	I						
BUTYLATE	2008415	5.00E-02	I						
N-BUTYLBENZENE	104518	1.00E-02	E						

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SEC-BUTYLBENZENE	135988	1.00E-02	E						
TERT-BUTYLBENZENE	98066	1.00E-02	E						
CADMIUM-WATER	7440439	5.00E-04	I					6.30E+00	I
CAPROLACTAM	105602	5.00E-01	I						
CARBARYL	63252	1.00E-01	I						
CARBON DISULFIDE	75150	1.00E-01	I			2.00E-01	I		
CARBON TETRACHLORIDE	56235	7.00E-04	I	1.30E-01	I	5.71E-04	E	5.30E-02	I
CARBOSULFAN	55285148	1.00E-02	I						
**CHLORAL	75876	2.00E-03	I						
CHLORANIL	118752			4.00E-01	H				
CHLORDANE	57749	5.00E-04	I	3.5E-01	I	2.00E-04	I	3.5E-01	I
CHLORINE	7782505	1.00E-01	I						
CHLOROACETIC ACID	79118	2.00E-03	H						
4-CHLOROANILINE	106478	4.00E-03	I						
**CHLOROBENZENE	108907	2.00E-02	I			1.7E-02	E		
CHLOROBENZILATE	510156	2.00E-02	I	2.70E-01	H			2.70E-01	H
P-CHLOROBENZOIC ACID	74113	2.00E-01	H						
2-CHLORO-1,3-BUTADIENE	126998	2.00E-02	A			2.00E-03	H		
1-CHLOROBUTANE	109693	4.00E-01	H						
CHLOROETHANE	75003	4.00E-01	E	2.90E-03	E	2.90E+00	I		
CHLOROFORM	67663	1.00E-02	I	6.10E-03	I	8.6E-05	E	8.10E-02	I
**CHLOROMETHANE	74873			1.30E-02	H	8.6E-02	E	3.5E-03	E
4-CHLORO-2-METHYLANILINE	95692			5.80E-01	H				
BETA-CHLORONAPHTHALENE	91587	8.00E-02	I						
O-CHLORONITROBENZENE	88733			2.50E-02	H				
P-CHLORONITROBENZENE	100005			1.80E-02	H				
**2-CHLOROPHENOL	95578	5.00E-03	I						
O-CHLOROTOLUENE	95498	2.00E-02	I						
CHLORPYRIFOS	2921882	3.00E-03	I						
CHLORPYRIFOS-METHYL	5598130	1.00E-02	H						
**CHROMIUM III	16065831	1.50E+00	I						
**CHROMIUM VI	18540299	3.00E-03	I			3.00E-05	I	4.10E+01	H
COBALT	7440484	6.00E-02	E						
COPPER	7440508	4.00E-02	H						
**CROTONALDEHYDE	123739			1.90E+00	H				
CUMENE	98828	1.00E-01	I			1.10E-01	I		
CYANIDE (FREE)	57125	2.00E-02	I						
CALCIUM CYANIDE	592018	4E-02	I						
COPPER CYANIDE	544923	5.00E-03	I						
CYANAZINE	21725462	2.00E-03	H	8.40E-01	H				
CYANOGEN	460195	4.00E-02	I						
CYANOGEN BROMIDE	506683	9.00E-02	I						
CYANOGEN CHLORIDE	506774	5.00E-02	I						
HYDROGEN CYANIDE	74908	2.00E-02	I			8.60E-04	I		
POTASSIUM CYANIDE	151508	5.00E-02	I						
POTASSIUM SILVER CYANIDE	506616	2.00E-01	I						
SILVER CYANIDE	506649	1.00E-01	I						
SODIUM CYANIDE	143339	4.00E-02	I						
THIOCYANATE		1.00E-01	E						
ZINC CYANIDE	557211	5.00E-02	I						
CYCLOHEXANONE	108941	5.00E+00	I						

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CYHALOTHRIN/KARATE	68085858	5.00E-03	I						
CYPERMETHRIN	52315078	1.00E-02	I						
DACTHAL	1861321	1.00E-02	I						
DALAPON	75990	3.00E-02	I						
DDD	72548			2.40E-01	I				
DDE	72559			3.40E-01	I				
DDT	50293	5.00E-04	I	3.40E-01	I			3.40E-01	I
DIAZINON	333415	9.00E-04	H						
DIBENZOFURAN	132649	4.00E-03	E						
**1,4-DIBROMOBENZENE	106376	1.00E-02	I						
DIBROMOCHLOROMETHANE	124481	2.00E-02	I	8.40E-02	I				
1,2-DIBROMO-3-CHLOROPROPANE	96128			1.40E+00	H	5.70E-05	I	2.40E-03	H
1,2-DIBROMOETHANE	106934			8.50E+01	I	5.70E-05	H	7.60E-01	I
DIBUTYLPHTHALATE	84742	1.00E-01	I						
DICAMBA	1918009	3.00E-02	I						
1,2-DICHLOROBENZENE	95501	9.00E-02	I			9.00E-03	E		
**1,3-DICHLOROBENZENE	541731	9.00E-04	E						
1,4-DICHLOROBENZENE	106467	3.00E-02	E	2.40E-02	H	2.29E-01	I	2.2E-02	E
3,3'-DICHLOROBENZIDINE	91941			4.50E-01	I				
DICHLORODIFLUOROMETHANE	75718	2.00E-01	I			5.00E-02	A		
1,1-DICHLOROETHANE	75343	1.00E-01	H			1.40E-01	A		
1,2-DICHLOROETHANE	107062	3.00E-02	E	9.10E-02	I	1.40E-03	E	9.10E-02	I
1,1-DICHLOROETHENE	75354	9.00E-03	I	6.00E-01	I			1.75E-01	I
CIS-1,2-DICHLOROETHENE	156592	1.00E-02	H						
TRANS-1,2-DICHLOROETHENE	156605	2.00E-02	I						
TOTAL 1,2-DICHLOROETHENE	540590	9.00E-03	H						
2,4-DICHLOROPHENOL	120832	3.00E-03	I						
**2,4-D	94757	1.00E-02	I						
4-(2,4-DICHLOROPHENOXY)BUTYRIC ACID	94826	8E-03	I						
1,2-DICHLOROPROPANE	78875			6.80E-02	H	1.14E-03	I		
2,3-DICHLOROPROPANOL	616239	3.00E-03	I						
1,3-DICHLOROPROPENE	542756	3.00E-04	I	1.80E-01	H	5.71E-03	I	1.30E-01	H
DICHLORVOS	62737	5E-04	I	0.29	I	1.43E-04	I		
DICOFOL	115322			4.4E-01	W				
DICYCLOPENTADIENE	77736	3E-02	H			6.00E-05	A		
DIELDRIN	60571	5.00E-05	I	1.60E+01	I			1.60E+01	I
DIETHYLPHTHALATE	84662	8.00E-01	I						
DIETHYLENE GLYCOL, MONOETHYL ETHER	111900	2.00E+00	H						
DI(2-ETHYLHEXYL)ADIPATE	103231	6.00E-01	I	1.20E-03	I				
DIETHYLSTILBESTROL	56531			4.70E+03	H				
DIFENZOQUAT (AVENGE)	43222486	8.00E-02	I						
DIISOPROPYL METHYLPHOSPHONATE (DIMP)	1445756	8.00E-02	I						
3,3'-DIMETHOXYBENZIDINE	119904			1.40E-02	H				
2,4-DIMETHYLANILINE HYDROCHLORIDE	21436964			5.80E-01	H				
2,4-DIMETHYLANILINE	95681			7.50E-01	H				
N,N-DIMETHYLANILINE	121697	2.00E-03	I						
3,3'-DIMETHYLBENZIDINE	119937			9.20E+00	H				
1,1-DIMETHYLHYDRAZINE	57147			2.60E+00	W			3.50E+00	W
1,2-DIMETHYLHYDRAZINE	540738			3.70E+01	W			3.70E+01	W
2,4-DIMETHYLPHENOL	105679	2.00E-02	I						
2,6-DIMETHYLPHENOL	576261	6.00E-04	I						

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3,4-DIMETHYLPHENOL	95658	1.00E-03	I						
DIMETHYLPHTHALATE	131113	1.00E+01	W						
1,2-DINITROBENZENE	528290	4.00E-04	H						
1,3-DINITROBENZENE	99650	1.00E-04	I						
1,4-DINITROBENZENE	100254	4.00E-04	H						
4,6-DINITRO-O-CYCLOHEXYL PHENOL	131895	2.00E-03	I						
4,6-DINITRO-2-METHYLPHENOL	534521	1.00E-04	E						
2,4-DINITROPHENOL	51285	2.00E-03	I						
DINITROTOLUENE MIX				6.80E-01	I				
2,4-DINITROTOLUENE	121142	2.00E-03	I						
2,6-DINITROTOLUENE	606202	1.00E-03	H						
**DINOSEB	88857	1.00E-03	I						
DIOCTYLPHTHALATE	117840	2.00E-02	H						
1,4-DIOXANE	123911			1.10E-02	I				
DIPHENYLAMINE	122394	2.50E-02	I						
1,2-DIPHENYLHYDRAZINE	122667			8.00E-01	I			8.00E-01	I
DIQUAT	85007	2.20E-03	I						
**DISULFOTON	298044	4.00E-05	I						
1,4-DITHIANE	505293	1.00E-02	I						
DIURON	330541	2.00E-03	I						
ENDOSULFAN	115297	6.00E-03	I						
Endothal	145733	2.00E-02	I						
ENDRIN	72208	3.00E-04	I						
**EPICHLOROHYDRIN	106898	2.00E-03	H	9.90E-03	I	2.86E-04	I	4.20E-03	I
ETHION	563122	5.00E-04	I						
2-ETHOXYETHANOL	110805	4.00E-01	H			5.70E-02	I		
ETHYL ACETATE	141786	9.00E-01	I						
ETHYLBENZENE	100414	1.00E-01	I			2.90E-01	I		
ETHYLENE DIAMINE	107153	2.00E-02	H						
ETHYLENE GLYCOL	107211	2.00E+00	I						
**ETHYLENE OXIDE	75218			1.00E+00	H			3.50E-01	H
ETHYLENE THIOUREA	96457	8.00E-05	I	1.1E-01	H				
ETHYL ETHER	60297	2.00E-01	I						
ETHYL METHACRYLATE	97632	9.00E-02	H						
FENAMIPHOS	22224926	2.50E-04	I						
FLUOMETURON	2164172	1.30E-02	I						
FLUORINE	7782414	6.00E-02	I						
FOMESAFEN	72178020			1.90E-01	I				
FONOFOS	944229	2.00E-03	I						
FORMALDEHYDE	50000	2.00E-01	I					4.50E-02	I
FORMIC ACID	64186	2.00E+00	H						
FURAN	110009	1.00E-03	I						
FURAZOLIDONE	67458			3.80E+00	H				
FURFURAL	98011	3.00E-03	I			1.00E-02	A		
GLYCIDALDEHYDE	765344	4.00E-04	I			2.90E-04	H		
GLYPHOSATE	1071836	1.00E-01	I						
ALPHA-HCH	319846			6.30E+00	I			6.30E+00	I
BETA-HCH	319857			1.80E+00	I			1.80E+00	I
GAMMA-HCH (LINDANE)	58899	3.00E-04	I	1.30E+00	H				
TECHNICAL HCH	608731			1.80E+00	I			1.80E+00	I
**HEPTACHLOR	76448	5.00E-04	I	4.50E+00	I			4.50E+00	I

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**HEPTACHLOR EPOXIDE	1024573	1.30E-05	I	9.10E+00	I			9.10E+00	I
HEXABROMOBENZENE	87821	2.00E-03	I						
**HEXACHLOROBENZENE	118741	8.00E-04	I	1.60E+00	I			1.60E+00	I
**HEXACHLOROBUTADIENE	87683	2.00E-04	H	7.80E-02	I			7.80E-02	I
**HEXACHLOROCYCLOPENTADIENE	77474	7.00E-03	I			2.00E-05	H		
HEXACHLORODIBENZODIOXIN MIX	19408743			6.20E+03	I			4.55E+03	I
**HEXACHLOROETHANE	67721	1.00E-03	I	1.40E-02	I			1.40E-02	I
HEXACHLOROPHENE	70304	3.00E-04	I						
HEXANE	110543	6.00E-02	H			5.71E-02	I		
2-HEXANONE	591786	4.00E-02	E			1.4E-03	E		
HEXAZINONE	51235042	3.30E-02	I						
HMX	2691410	5.00E-02	I						
HYDRAZINE	302012			3.00E+00	I			1.70E+01	I
HYDROGEN SULFIDE	7783064	3.00E-03	I			2.85E-04	I		
HYDROQUINONE	123319	4.00E-02	H						
IRON	7439896	3.00E-01	E						
ISOBUTANOL	78831	3.00E-01	I						
ISOPHORONE	78591	2.00E-01	I	9.50E-04	I				
ISOPROPALIN	33820530	1.50E-02	I						
ISOPROPYL METHYL PHOSPHONIC ACID	1832548	1.00E-01	I						
Lead									
LITHIUM	7439932	2.00E-02	E						
MALATHION	121755	2.00E-02	I						
MALEIC ANHYDRIDE	108316	1.00E-01	I						
MANGANESE	7439965	2.00E-02	I			1.43E-05	I		
MEPHOSFOLAN	950107	9.00E-05	H						
MEPIQUAT CHLORIDE	24307264	3.00E-02	I						
MERCURIC CHLORIDE	7487947	3.00E-04	I						
MERCURY (INORGANIC)	7439976					8.60E-05	I		
METHYLMERCURY	22967926	1.00E-04	I						
METHACRYLONITRILE	126987	1.00E-04	I			2.00E-04	A		
METHANOL	67561	5.00E-01	I						
METHIDATHION	950378	1.00E-03	I						
METHOXYCHLOR	72435	5.00E-03	I						
METHYL ACETATE	79209	1.00E+00	H						
METHYL ACRYLATE	96333	3.00E-02	A						
2-METHYLANILINE	95534			2.40E-01	H				
4-(2-METHYL-4-CHLOROPHENOXY) BUTYRIC ACID	94815	1.00E-02	I						
2-METHYL-4-CHLOROPHENOXYACETIC ACID (MCPA)	94746	5.00E-04	I						
2-(2-METHYL-4-CHLOROPHENOXY)PROPIONIC ACID (MCPP)	93652	1.00E-03	I						
METHYLENE BROMIDE	74953	1.00E-02	A						
METHYLENE CHLORIDE	75092	6.00E-02	I	7.50E-03	I	8.60E-01	H	1.65E-03	I
4,4'-METHYLENE BIS(2-CHLOROANILINE)	101144	7.00E-04	H	1.30E-01	H			1.30E-01	H
4,4'-METHYLENE BIS(N,N'-DIMETHYL)ANILINE	101611			4.60E-02	I				
METHYL ETHYL KETONE (2-BUTANONE)	78933	6.00E-01	I			2.86E-01	I		
METHYL HYDRAZINE	60344			1.10E+00	W				
**METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	108101	8.00E-02	H			2.00E-02	A		
METHYL METHACRYLATE	80626	1.40E+00	I			2.00E-01	I		
2-METHYL-5-NITROANILINE	99558			3.30E-02	H				
METHYL PARATHION	298000	2.50E-04	I						
2-METHYLPHENOL	95487	5.00E-02	I						

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3-METHYLPHENOL	108394	5.00E-02	I						
4-METHYLPHENOL	106445	5.00E-03	H						
METHYLSTYRENE MIX	25013154	6.00E-03	A			1.00E-02	A		
ALPHA-METHYLSTYRENE	98839	7.00E-02	A						
METHYL TERT-BUTYL ETHER	1634044					8.57E-01	I		
METOLACHLOR (DUAL)	51218452	1.50E-01	I						
**MIREX	2385855	2.00E-04	I						
MOLYBDENUM	7439987	5E-03	I						
**MONOCHLORAMINE	10599903	1E-01	I			1.00E-01	H		
NALED	300765	2E-03	I						
NICKEL	7440020	2.00E-02	I						
NITRATE	14797558	1.60E+00	I						
NITRIC OXIDE	10102439	1.00E-01	W						
NITRITE	14797650	1.00E-01	I						
2-NITROANILINE	88744					5.70E-05	H		
**NITROBENZENE	98953	5.00E-04	I			6.00E-04	A		
NITROFURANTOIN	67209	7.00E-02	H						
NITROFURAZONE	59870			1.50E+00	H				
NITROGEN DIOXIDE	10102440	1.00E+00	W						
**NITROGLYCERIN	55630			1.4E-02	E				
4-NITROPHENOL	100027	8.00E-03	E						
**N-NITROSO-DI-N-BUTYLAMINE	924163			5.40E+00	I			5.60E+00	I
N-NITROSODIETHANOLAMINE	1116547			2.80E+00	I				
N-NITROSODIETHYLAMINE	55185			1.50E+02	I			1.50E+02	I
N-NITROSODIMETHYLAMINE	62759			5.10E+01	I			5.10E+01	I
N-NITROSODIPHENYLAMINE	86306			4.90E-03	I				
N-NITROSODIPROPYLAMINE	621647			7.00E+00	I				
N-NITROSO-N-ETHYLUREA	759739			1.40E+02	H				
N-NITROSO-N-METHYLETHYLAMINE	10595956			2.20E+01	I				
N-NITROSOPYRROLIDINE	930552			2.10E+00	I			2.10E+00	I
M-NITROTOLUENE	99081	2.00E-02	E						
O-NITROTOLUENE	88722	1.00E-02	H						
P-NITROTOLUENE	99990	1.00E-02	H						
**NUSTAR	85509199	7.00E-04	I						
ORYZALIN	19044883	5.00E-02	I						
OXADIAZON	19666309	5.00E-03	I						
OXAMYL	23135220	2.50E-02	I						
OXYFLUORFEN	42874033	3.00E-03	I						
PARAQUAT DICHLORIDE	1910425	4.50E-03	I						
PARATHION	56382	6.00E-03	H						
**PENTACHLOROBENZENE	608935	8.00E-04	I						
**PENTACHLORONITROBENZENE	82688	3.00E-03	I	2.60E-01	H				
PENTACHLOROPHENOL	87865	3.00E-02	I	1.20E-01	I				
PERMETHRIN	52645531	5.00E-02	I						
Petroleum Hydrocarbons									
C5 through C8 Aliphatic Hydrocarbons									
C9 through C12 Aliphatic Hydrocarbons									
C9 through C18 Aliphatic Hydrocarbons									
C19 through C36 Aliphatic Hydrocarbons									
C9 through C10 Aromatic Hydrocarbons									
C11 through C22 Aromatic Hydrocarbons									

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PHENOL	108952	6.00E-01	I						
M-PHENYLENEDIAMINE	108452	6.00E-03	I						
O-PHENYLENEDIAMINE	95545			4.70E-02	H				
P-PHENYLENEDIAMINE	106503	1.90E-01	H						
2-PHENYLPHENOL	90437			1.90E-03	H				
PHOSPHINE	7803512	3.00E-04	I			8.60E-05	I		
PHOSPHORUS (WHITE)	7723140	2.00E-05	I						
P-PHTHALIC ACID	100210	1.00E+00	H						
PHTHALIC ANHYDRIDE	85449	2.00E+00	I			3.43E-02	H		
Picloram	1918021	7.00E-02	I						
POLYBROMINATED BIPHENYLS		7.00E-06	H	8.90E+00	H				
POLYCHLORINATED BIPHENYLS	1336363			2.00E+00	I			2.00E+00	I
AROCLOR-1016	12674112	7.00E-05	I	7.00E-02	I			7.00E-02	I
AROCLOR-1221	11104282			2.00E+00	I			2.00E+00	I
AROCLOR-1232	11141165			2.00E+00	I			2.00E+00	I
AROCLOR-1242	53469219			2.00E+00	I			2.00E+00	I
AROCLOR-1248	12672296			2.00E+00	I			2.00E+00	I
AROCLOR-1254	11097691	2.00E-05	I	2.00E+00	I			2.00E+00	I
AROCLOR-1260	11096825			2.00E+00	I			2.00E+00	I
POLYCHLORINATED TERPHENYLS	61788338			4.50E+00	E				
POLYNUCLEAR AROMATIC HYDROCARBONS:									
**ACENAPHTHENE	83329	6.00E-02	I						
**ANTHRACENE	120127	3.00E-01	I						
BENZ[A]ANTHRACENE	56553			7.30E-01	E				
BENZO[B]FLUORANTHENE	205992			7.30E-01	E				
BENZO[K]FLUORANTHENE	207089			7.30E-02	E				
BENZO[A]PYRENE	50328			7.30E+00	I			3.10E+00	E
CARBAZOLE	86748			2.00E-02	H				
CHRYSENE	218019			7.30E-03	E				
DIBENZ[A,H]ANTHRACENE	53703			7.30E+00	E				
**DIBENZOFURAN	132649	4.00E-03	E						
FLUORANTHENE	206440	4.00E-02	I						
**FLUORENE	86737	4.00E-02	I						
INDENO[1,2,3-C,D]PYRENE	193395			7.30E-01	E				
**2-METHYLNAPHTHALENE	91576	2.00E-02	E						
**NAPHTHALENE	91203	2.00E-02	I			9.00E-04	I		
Phenanthrene									
**PYRENE	129000	3.00E-02	I						
N-PROPYLBENZENE		1.00E-02	E						
PROMETON	1610180	1.50E-02	I						
PROMETRYN	7287196	4.00E-03	I						
PROPACHLOR	1918167	1.30E-02	I						
PROPANIL	709988	5.00E-03	I						
PROPARGITE	2312358	2.00E-02	I						
PROPYLENE GLYCOL	57556	2.00E+01	H						
PROPYLENE GLYCOL, MONOETHYL ETHER	52125538	7.00E-01	H						
PROPYLENE GLYCOL, MONOMETHYL ETHER	107982	7.00E-01	H			5.70E-01	I		
PURSUIT	81335775	2.50E-01	I						
PYRIDINE	110861	1.00E-03	I						
QUINOLINE	91225			1.20E+01	H				
RDX	121824	3.00E-03	I	1.10E-01	I				

TOXICOLOGICAL CONSTANTS USED TO DERIVE HUMAN HEALTH URS VALUES

Reference: EPA Region III RBC Table - April 1999

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** = denotes a change since the original February 1998 version

Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg·d/mg		CPSi kg·d/mg	
RESMETHRIN	10453868	3.00E-02	I						
**RONNEL	299843	5.00E-02	H						
ROTENONE	83794	4.00E-03	I						
SELENIOUS ACID	7783008	5.00E-03	I						
SELENIUM	7782492	5.00E-03	I						
SILVER	7440224	5.00E-03	I						
SIMAZINE	122349	5.00E-03	I	1.20E-01	H				
SODIUM AZIDE	26628228	4.00E-03	I						
SODIUM DIETHYLDITHIOCARBAMATE	148185	3.00E-02	I	2.70E-01	H				
STRONTIUM, STABLE	7440246	6.00E-01	I						
STRYCHNINE	57249	3.00E-04	I						
STYRENE	100425	2.00E-01	I			2.86E-01	I		
2,3,7,8-TETRACHLORODIBENZODIOXIN	1746016			1.50E+05	H			1.50E+05	H
**1,2,4,5-TETRACHLOROBENZENE	95943	3.00E-04	I						
1,1,1,2-TETRACHLOROETHANE	630206	3.00E-02	I	2.60E-02	I			2.60E-02	I
1,1,2,2-TETRACHLOROETHANE	79345	6.00E-02	E	2.00E-01	I			2.00E-01	I
TETRACHLOROETHENE	127184	1.00E-02	I	5.20E-02	E	1.4E-01	E	2.00E-03	E
2,3,4,6-TETRACHLOROPHENOL	58902	3.00E-02	I						
**P,A,A,A-TETRACHLOROTOLUENE	5216251			2.00E+01	H				
**TETRAHYDROFURAN	109999	2.00E-02	E	7.6E-03	E	8.6E-02	E	6.8E-03	E
**TETRAETHYLLEAD	78002	1.00E-07	I						
TETRYL	479458	1.00E-02	H						
THALLIC OXIDE	1314325	7.00E-05	W						
THALLIUM	7440280	7.00E-05	O						
THALLIUM ACETATE	563688	9.00E-05	I						
THALLIUM CARBONATE	6533739	8.00E-05	I						
THALLIUM CHLORIDE	7791120	8.00E-05	I						
THALLIUM NITRATE	10102451	9.00E-05	I						
THALLIUM SULFATE (2:1)	7446186	8.00E-05	I						
THIOBENCARB	28249776	1.00E-02	I						
TIN	7440315	6.00E-01	H						
TITANIUM	7440326	4.00E+00	E			8.60E-03	E		
TITANIUM DIOXIDE	13463677	4.00E+00	E			8.60E-03	E		
TOLUENE	108883	2.00E-01	I			1.14E-01	I		
TOLUENE-2,4-DIAMINE	95807			3.20E+00	H				
TOLUENE-2,5-DIAMINE	95705	6.00E-01	H						
TOLUENE-2,6-DIAMINE	823405	2.00E-01	H						
P-TOLUIDINE	106490			1.90E-01	H				
**TOXAPHENE	8001352			1.10E+00	I			1.10E+00	I
**1,2,4-TRIBROMOBENZENE	615543	5.00E-03	I						
TRIBUTYLTIN OXIDE	56359	3.00E-04	I						
2,4,6-TRICHLOROANILINE	634935			3.40E-02	H				
1,2,4-TRICHLOROBENZENE	120821	1.00E-02	I			5.70E-02	H		
1,1,1-TRICHLOROETHANE	71556	2.00E-02	E			2.86E-01	E		
1,1,2-TRICHLOROETHANE	79005	4.00E-03	I	5.70E-02	I			5.60E-02	I
TRICHLOROETHENE	79016	6.00E-03	E	1.10E-02	E			6.00E-03	E
TRICHLOROFLUOROMETHANE	75694	3.00E-01	I			2.00E-01	A		
2,4,5-TRICHLOROPHENOL	95954	1.00E-01	I						
2,4,6-TRICHLOROPHENOL	88062			1.10E-02	I			1.00E-02	I
2,4,5-T	93765	1.00E-02	I						
2-(2,4,5-TRICHLOROPHENOXY)PROPIONIC ACID	93721	8.00E-03	I						

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Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg·d/mg		CPSi kg·d/mg	
1,1,2-TRICHLOROPROPANE	598776	5.00E-03	I						
1,2,3-TRICHLOROPROPANE	96184	6.00E-03	I	7.00E+00	H				
1,2,3-TRICHLOROPROPENE	96195	5.00E-03	H						
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76131	3.00E+01	I			8.60E+00	H		
1,2,4-TRIMETHYLBENZENE	95636	5.00E-02	E			1.70E-03	E		
1,3,5-TRIMETHYLBENZENE	108678	5.00E-02	E			1.70E-03	E		
TRIMETHYL PHOSPHATE	512561			3.70E-02	H				
1,3,5-TRINITROBENZENE	99354	3.00E-02	I						
2,4,6-TRINITROTOLUENE	118967	5.00E-04	I	3.00E-02	I				
URANIUM (SOLUBLE SALTS)		3.00E-03	I						
VANADIUM	7440622	7.00E-03	H						
VANADIUM PENTOXIDE	1314621	9.00E-03	I						
VANADIUM SULFATE	16785812	2.00E-02	H						
VINCLOZOLIN	50471448	2.50E-02	I						
VINYL ACETATE	108054	1.00E+00	H			5.71E-02	I		
VINYL CHLORIDE	75014			1.90E+00	H			3.00E-01	H
WARFARIN	81812	3.00E-04	I						
M-XYLENE	108383	2.00E+00	H						
O-XYLENE	95476	2.00E+00	H						
P-XYLENE	106423								
XYLENES	1330207	2.00E+00	I						
ZINC	7440666	3.00E-01	I						
ZINC PHOSPHIDE	1314847	3E-04	I						
ZINEB	12122677	5E-02	I						

KOC AND KD DATA USED TO DERIVE SOIL URS (CALB CALCULATION)

References:

(1) Pennsylvania Bulletin. Vol. 27. N0. 33. August 16, 1997. Harrisburg, PA.
(2) Cohen, Robert M. and James W. Mercer. DNAPL Site Evaluation.
C.K. Smoley. 1993: Appendix A.
(3) Dragun, James. The Soil Chemistry of Hazardous Materials
The Hazardous Materials Control Research Institute. 1988: 236-242.

Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
Acetaldehyde	N	75070		4.1	1
Acetochlor	N	34256821			
Acetone	N	67641		0.31	1
Acetonitrile	N	75078		0.5	1
Acetophenone	N	98862	x	170	1
Acrolein	N	107028		0.56	1
Acrylamide	C	79061		25	1
Acrylonitrile	C	107131	x	11	1
Alachlor	C	15972608		110	1
Alar	N	1596845			
Aldicarb	N	116063		22	1
Aldicarb sulfone	N	1646884			
Aldrin	C	309002		48000	1
Aluminum	N	7429905			
Aminodinitrotoluenes					
4-Aminopyridine	N	504245			
Aniline	N	62533		190	1
Antimony and compounds	N	7440360		45	1
Antimony pentoxide	N	1314609			
Antimony tetroxide	N	1332316			
Antimony trioxide	N	1309644			
Arsenic (as carcinogen)	C	7440382			
Assure	N	76578148			
Atrazine	C	1912249		130	1
Azobenzene	C	103333			
Barium and compounds	N	7440393		41	1
Baygon	N	114261			
Baythroid	N	68359375			
Bentazon	N	25057890			
Benzaldehyde	N	100527	x		
Benzene	C	71432	x	58	1
Benzenethiol	N	108985			
Benzidine	C	92875			
Benzoic acid	N	65850		32	1
Benzyl alcohol	N	100516		100	1
Benzyl chloride	C	100447	x	190	1
Beryllium and compounds	C	7440417		790	1
1,1-Biphenyl	N	92524			
Bis(2-chloroethyl)ether	C	111444	x	76	1
Bis(2-chloroisopropyl)ether	C	39638329	x	62	1

KOC AND KD DATA USED TO DERIVE SOIL URS (CALB CALCULATION)

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Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
Bis(2-chloroisopropyl)ether					
Bis(chloromethyl)ether	C	542881	x	16	1
Bis(2-ethylhexyl)phthalate (DEHP)	C	117817		87000	1
Boron (and borates)	N	7440428			
Bromodichloromethane	C	75274	x	93	1
Bromoform (tribromomethane)	C	75252	x	282	2
Bromomethane	C	74839	x	170	1
Bromophos	N	2104963			
1-Butanol	N	71363			
N-Butylbenzene					
Butyl benzyl phthalate	N	85687		34000	1
Butylate	N	2008415			
sec-Butylbenzene	N	135988	x		
tert-Butylbenzene	N	104518	x		
Cadmium and compounds	N	7440439		75	1
Cadmium-Water					
Cadmium-Food					
Caprolactam	N	105602			
Carbaryl	N	63252		190	1
Carbon disulfide	N	75150	x	300	1
Carbon tetrachloride	C	56235	x	160	1
Carbosulfan	N	55285148			
Chloral	N	75876			
Chloranil	C	118752			
Chlordane	C	57749		98000	1
Chlorine	N	7782505			
Chloroacetic acid	N	79118			
4-Chloroaniline	N	106478		460	1
Chlorobenzene	N	108907	x	200	1
Chlorobenzilate	C	510156		2600	1
p-Chlorobenzoic acid	N	74113			
2-Chloro-1,3-butadiene	N	126998	x		
1-Chlorobutane	N	109693	x		
Chloroethane	C	75003	x	42	1
Chloroform	C	67663	x	56	1
Chloromethane	C	74873	x		
4-Chloro-2-methylaniline	C	95692			
beta-Chloronaphthalene	N	91587		8500	1
o-Chloronitrobenzene	C	88733	x		
p-Chloronitrobenzene	C	100005	x		

KOC AND KD DATA USED TO DERIVE SOIL URS (CALB CALCULATION)

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Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
2-Chlorophenol	N	95578		400	1
o-Chlorotoluene	N	95498	x	1585	2
Chlorpyrifos	N	2921882		4600	1
Chlorpyrifos-methyl	N	5598130		3300	3
Chromium III and compounds	N	16065831		1800000	1
Chromium VI and compounds	N	18540299		19	1
Cobalt	N	7440484			
Copper and compounds	N	7440508		360	1
Crotonaldehyde	C	123739		5.6	1
Cumene	N	98828		2800	1
Cyanides:					
Calcium cyanide	N	592018			
Copper cyanide	N	544923			
Cyanazine	C	21725462		200	3
Cyanogen	N	460195			
Cyanogen bromide	N	506683			
Cyanogen chloride	N	506774			
Free cyanide	N	57125		9.9	1
Hydrogen cyanide	N	74908			
Potassium cyanide	N	151508			
Potassium silver cyanide	N	506616			
Silver cyanide	N	506649			
Sodium cyanide	N	143339			
Thiocyanate	N	0			
Zinc cyanide	N	557211			
Cyclohexanone	N	108941	x	66	1
Cyhalothrin/Karate	N	68085858			
Cypermethrin	N	52315078			
Dacthal	N	1861321			
Dalapon	N	75990			
DDD	C	72548		44000	1
DDE	C	72559		87000	1
DDT	C	50293		240000	1
Diazinon	N	333415		500	1
Dibenzofuran	N	132649			
1,4-Dibromobenzene	N	106376	x		
Dibromochloromethane					
1,2-Dibromo-3-chloropropane	C	96128	x	140	1
1,2-Dibromoethane	C	106934	x	54	1
Dibutyl phthalate	N	84742			

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Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
Dicamba	N	1918009		0.4	3
1,2-Dichlorobenzene	N	95501	x	350	1
1,3-Dichlorobenzene	N	541731	x	360	1
1,4-Dichlorobenzene	C	106467	x	510	1
3,3'-Dichlorobenzidine	C	91941		22000	1
Dichlorodifluoromethane (Freon 12)	N	75718	x	360	1
1,1-Dichloroethane	N	75343	x	52	1
1,2-Dichloroethane (EDC)	C	107062	x	38	1
1,1-Dichloroethylene	C	75354	x	65	1
1,2-Dichloroethylene (cis)	N	156592	x	49	1
1,2-Dichloroethylene (trans)	N	156605	x	47	1
1,2-Dichloroethylene (mixture)	N	540590	x		
2,4-Dichlorophenol	N	120832		160	1
2,4-Dichlorophenoxyacetic Acid (2,4-D)	N	94757	x	59	1
4-(2,4-Dichlorophenoxy)butyric Acid	N	94826			
1,2-Dichloropropane	C	78875	x	47	1
2,3-Dichloropropanol	N	616239			
1,3-Dichloropropene	C	542756	x	48	2
Dichlorvos	C	62737		50	1
Dicofol	C	115322			
Dicyclopentadiene	N	77736	x		
Dieldrin	C	60571		11000	1
Diethyl phthalate	N	84662		81	1
Diethylene glycol, monoethyl ether	N	111900			
Di(2-ethylhexyl)adipate	C	103231			
Diethylstilbestrol	C	56531			
Difenzoquat (Avenge)	N	43222486			
Diisopropyl methylphosphonate (DIMP)	N	1445756			
3,3'-Dimethoxybenzidine	C	119904			
2,4-Dimethylaniline hydrochloride	C	21436964			
2,4-Dimethylaniline	C	95681			
N-N-Dimethylaniline	N	121697			
3,3'-Dimethylbenzidine	C	119937			
1,1-Dimethylhydrazine	C	57147		0.2	1
1,2-Dimethylhydrazine	C	540738			
2,4-Dimethylphenol	N	105679		130	1
2,6-Dimethylphenol	N	576261			
3,4-Dimethylphenol	N	95658			
Dimethyl phthalate	N	131113		43	2
1,2-Dinitrobenzene	N	528290			

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Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
1,3-Dinitrobenzene	N	99650		150	1
1,4-Dinitrobenzene	N	100254			
4,6-Dinitro-o-cyclohexyl phenol	N	131895			
4,6-Dinitro-2-Methylphenol					
2,4-Dinitrophenol	N	51285		0.79	1
Dinitrotoluene Mix					
2,4-Dinitrotoluene	N	121142		51	1
2,6-Dinitrotoluene	N	606202		74	1
Dinoseb	N	88857		120	1
di-n-Octyl phthalate	N	117840			
1,4-Dioxane	C	123911		7.8	1
Diphenylamine	N	122394		190	1
1,2-Diphenylhydrazine	C	122667		660	1
Diquat	N	85007		2.6	1
Disulfoton	N	298044		1000	1
1,4-Dithiane	N	505293			
Diuron	N	330541		300	1
Endosulfan	N	115297			
Endrin	N	72208		11000	1
Epichlorohydrin	C	106898		35	1
Ethion	N	563122		8700	1
2-Ethoxyethanol	N	110805		12	1
Ethyl acetate	N	141786		59	1
Ethylbenzene	N	100414	x	220	1
Ethylene diamine	N	107153			
Ethylene glycol	N	107211		4.4	1
Ethylene oxide	C	75218			
Ethylene thiourea (ETU)	C	96457			
Ethyl ether	N	60297	x	68	1
Ethyl methacrylate	N	97632			
Fenamiphos	N	22224926		300	1
Fluometuron	N	2164172		174	3
Fluoride	N	7782414			
Fomesafen	C	72178020			
Fonofos	N	944229		1100	1
Formaldehyde	N	50000		3.6	1
Formic Acid	N	64186		0.54	1
Furan	N	110009			
Furazolidone	C	67458			
Furfural	N	98011		6.3	1

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Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
Glycidaldehyde	N	765344			
Glyphosate	N	1071836		3500	1
HCH (alpha)	C	319846			
HCH (beta)	C	319857			
HCH (gamma) Lindane	C	58899			
HCH-technical	C	608731			
Heptachlor	C	76448	x	6800	1
Heptachlor epoxide	C	1024573	x	21000	1
Hexabromobenzene	N	87821	x		
Hexachlorobenzene	C	118741	x	3800	1
Hexachlorobutadiene	C	87683	x	4700	1
Hexachlorocyclopentadiene	N	77474	x	7200	1
Hexachlorodibenzo-p-dioxin mixture	C	19408743			
Hexachloroethane	C	67721	x	2200	1
Hexachlorophene	N	70304			
n-Hexane	N	110543	x	3600	1
2-Hexanone					
Hexazinone	N	51235042			
HMX					
Hydrazine, hydrazine sulfate	C	302012			
Hydrogen sulfide	N	7783064			
Hydroquinone	N	123319			
Iron	N	7439896			
Isobutanol	N	78831	x	60	1
Isophorone	C	78591		31	1
Isopropalin	N	33820530		75250	3
Isopropyl methyl phosphonic acid	N	1832548			
Lead	N	7439921		890	1
Lithium	N	7439932			
Malathion	N	121755		1300	1
Maleic anhydride	N	108316			
Manganese and compounds	N	7439965			
Manganese-Nonfood					
Manganese-Food					
Mephosfolan	N	950107			
Mepiquat chloride	N	24307264			
Mercuric chloride	N	7487947			
Mercury (inorganic)	N	7439976		52	1
Mercury (methyl)	N	22967926			
Methacrylonitrile	N	126987		21	1

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Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
Methanol	N	67561		2.8	1
Methidathion	N	950378			
Methoxychlor	N	72435		63000	1
Methyl acetate	N	79209			
Methyl acrylate	N	96333			
2-Methylaniline	C	95534			
4-(2-Methyl-4-chlorophenoxy) butyric acid	N	94815			
2-Methyl-4-chlorophenoxyacetic acid	N	94746			
2-(2-Methyl-14-chlorophenoxy)propionic acid	N	93652			
Methylene bromide	N	74953	x		
Methylene chloride	C	75092	x	8.7	2
4,4'-Methylene bis(2-chloroaniline)	C	101144			
4,4'-Methylene bis(N,N'-dimethyl)aniline	C	101611			
Methyl ethyl ketone	N	78933	x	32	1
Methyl hydrazine	C	60344			
Methyl isobutyl ketone	N	108101		17	1
Methyl methacrylate	N	80626		10	1
2-Methyl-5-nitroaniline	C	99558			
Methyl parathion	N	298000		790	1
2-Methylphenol (o-cresol)	N	95487			
3-Methylphenol (m-cresol)	N	103394			
4-Methylphenol (p-cresol)	N	106445			
Methyl styrene (mixture)	N	25013154	x		
Methyl styrene (alpha)	N	98839	x		
Methyl tertbutyl ether (MTBE)	N	1634044	x	12	1
Metolaclor (Dual)	N	51218452			
Mirex	C	2385855			
Molybdenum	N	7439987			
Monochloramine	N	10599903			
Naled	N	300765			
Nickel and compounds	N	7440020		65	1
Nitrate	N	14797558			
Nitric oxide	N	10102439			
Nitrite	N	14797650			
2-Nitroaniline	N	88744		27	1
Nitrobenzene	N	98953	x	130	1
Nitrofurantoin	N	67209			
Nitrofurazone	C	59870			
Nitrogen dioxide	N	10102440			
Nitroglycerin					

KOC AND KD DATA USED TO DERIVE SOIL URS (CALB CALCULATION)

References:

(1) Pennsylvania Bulletin. Vol. 27. N0. 33. August 16, 1997. Harrisburg, PA.
(2) Cohen, Robert M. and James W. Mercer. DNAPL Site Evaluation.
C.K. Smoley. 1993: Appendix A.
(3) Dragun, James. The Soil Chemistry of Hazardous Materials.
The Hazardous Materials Control Research Institute. 1988: 236-242.

Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
4-Nitrophenol	N	100027		230	1
N-Nitrosodi-n-butylamine	C	924163			
N-Nitrosodiethanolamine	C	1116547			
N-Nitrosodiethylamine	C	55185		26	1
N-Nitrosodimethylamine	C	62759		8.5	1
N-Nitrosodiphenylamine	C	86306		580	1
N-Nitroso di-n-propylamine	C	621647		11	1
N-Nitroso-N-ethylurea					
N-Nitroso-N-methylethylamine	C	10595956			
N-Nitrosopyrrolidine	C	930552			
m-Nitrotoluene	N	99081	x		
o-Nitrotoluene	N	88722	x		
p-Nitrotoluene	N	99990	x		
NuStar	N	85509199			
Oryzalin	N	19044883			
Oxadiazon	N	19666309		3241	3
Oxamyl	N	23135220		7.1	1
Oxyfluorfen	N	42874033			
Paraquat	N	1910425			
Parathion	N	56382		2300	1
Pentachlorobenzene	N	608935	x	32000	1
Pentachloronitrobenzene	C	82688	x	7900	1
Pentachlorophenol	C	87865		20000	1
Permethrin	N	52645531			
Petroleum Hydrocarbons					
C5 through C8 Aliphatic Hydrocarbons		n/a			
C9 through C12 Aliphatic Hydrocarbons		n/a			
C9 through C18 Aliphatic Hydrocarbons		n/a			
C19 through C36 Aliphatic Hydrocarbons		n/a			
C9 through C10 Aromatic Hydrocarbons		n/a			
C11 through C22 Aromatic Hydrocarbons		n/a			
Phenol	N	108952		22	1
m-Phenylenediamine	N	108452		12	1
o-Phenylenediamine					
p-Phenylenediamine	N	106503			
2-Phenylphenol	C	90437			
Phosphine	N	7803512			
Phosphorus (white)	N	7723140			
p-Phthalic acid	N	100210			
Phthalic anhydride	N	85449		79	1

KOC AND KD DATA USED TO DERIVE SOIL URS (CALB CALCULATION)

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Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
Polybrominated biphenyls	C	0			
Polychlorinated biphenyls (PCBs)	C	1336363			
Aroclor 1016	N	12674112		110000	1
Aroclor 1221	C	11104282		1900	1
Aroclor 1232	C	11141165		1500	1
Aroclor 1242	C	53469219		48000	1
Aroclor 1248	C	12672296		190000	1
Aroclor 1254	N	11097691		810000	1
Aroclor 1260	C	11096825		1800000	1
Polychlorinated terphenyls (PCTs)	C	0			
Polynuclear aromatic hydrocarbons					
Acenaphthene	N	83329		4900	1
Anthracene	N	120127		21000	1
Benzo[a]anthracene	C	56553		350000	1
Benzo[b]fluoranthene	C	205992		550000	1
Benzo[k]fluoranthene	C	207089		4400000	1
Benzo[a]pyrene	C	50328		910000	1
Carbazole	C	86748			
Chrysene	C	218019		490000	1
Dibenz[ah]anthracene	C	53703		1800000	1
Fluoranthene	N	206440		49000	1
Fluorene	N	86737		7900	1
Indeno[1,2,3-cd]pyrene	C	193395		31000000	1
2-Methylnaphthalene					
Naphthalene	N	91203		950	1
N-Propylbenzene					
Pyrene	N	129000		62700	3
Prometon	N	1610180		350	3
Prometryn	N	7287196		48	3
Propachlor	N	1918167		265	3
Propanil	N	709988			
Propargite	N	2312358			
Propylene glycol	N	57556			
Propylene glycol, monoethyl ether	N	52125538			
Propylene glycol, monomethyl ether	N	107982			
Pursuit	N	81335775			
Pyridine	N	110861		0.0066	1
Quinoline	C	91225			
RDX					
Resmethrin	N	10463868			

KOC AND KD DATA USED TO DERIVE SOIL URS (CALB CALCULATION)

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Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
Ronnel	N	299843			
Rotenone	N	83794			
Selenious Acid	N	7783008			
Selenium	N	7782492		5	1
Silver and compounds	N	7440224		8.3	1
Simazine	C	122349		110	1
Sodium azide	N	26628228			
Sodium diethyldithiocarbamate	C	148185			
Strontium, stable	N	7440246			
Strychnine	N	57249		280	1
Styrene	N	100425	x	910	1
2,3,7,8-TCDD (dioxin)	C	1746016		4300000	1
1,2,4,5-Tetrachlorobenzene	N	95943	x		
1,1,1,2-Tetrachloroethane	C	630206	x		
1,1,2,2-Tetrachloroethane	C	79345	x	79	1
Tetrachloroethylene (PCE)	C	127184	x	300	1
2,3,4,6-Tetrachlorophenol	N	58902		6200	1
p,a,a,a-Tetrachlorotoluene	C	5216251	x		
Tetraethyl lead	N	78002		4900	1
Tetryl					
Thallic oxide	N	1314325			
Thallium	N	7440280		71	1
Thallium acetate	N	563688			
Thallium carbonate	N	6533739			
Thallium chloride	N	7791120			
Thallium nitrate	N	10102451			
Thallium sulfate	N	7446186			
Thiobencarb	N	28249776			
Tin and compounds	N	7440315			
Titanium					
Titanium Dioxide					
Toluene	N	108883	x	130	1
Toluene-2,4-diamine	C	95807			
Toluene-2,5-diamine	N	95705			
Toluene-2,6-diamine	N	823405			
p-Toluidine	C	106490		320	1
Toxaphene	C	8001352		1500	1
1,2,4-Tribromobenzene	N	615543	x		
Tributyltin oxide (TBTO)	N	56359			
2,4,6-Trichloroaniline	C	634935			

KOC AND KD DATA USED TO DERIVE SOIL URS (CALB CALCULATION)

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Contaminant		CAS	VOC	Koc/Kd Value	Reference (see above)
1,2,4-Trichlorobenzene	N	120821	x	1500	1
1,1,1-Trichloroethane	N	71556	x	100	1
1,1,2-Trichloroethane	C	79005	x	76	1
Trichloroethylene (TCE)	C	79016	x	93	1
Trichlorofluoromethane	N	75694	x		
2,4,5-Trichlorophenol	N	95954		2400	1
2,4,6-Trichlorophenol	C	88062		1100	1
2,4,5-Trichlorophenoxyacetic acid	N	93765		43	1
2-(2,4,5-Trichlorophenoxy)propionic acid	N	93721		1700	1
1,1,2-Trichloropropane	N	598776	x		
1,2,3-Trichloropropane	C	96184	x	280	1
1,2,3-Trichloropropene	N	96195	x		
1,1,2-Trichloro-1,2,2- trifluoroethane	N	76131	x	389	2
1,2,4-Trimethylbenzene	N	95636	x		
1,3,5-Trimethylbenzene	N	108678	x		
Trimethyl phosphate	C	512561			
1,3,5-Trinitrobenzene	N	99354			
2,4,6-Trinitrotoluene	C	118967			
Uranium (soluble salts)	N	7440611			
Vanadium	N	7440622		1000	1
Vanadium pentoxide	N	1314621			
Vanadium sulfate	N	36907423			
Vinclozolin	N	50471448			
Vinyl acetate	N	108054		2.8	1
Vinyl chloride	C	75014	x	10	1
Warfarin	N	81812		910	1
m-Xylene	N	108323	x		
o-Xylene	N	95476	x		
p-Xylene	N	106423	x		
Xylene (mixed)	N	1330207	x	350	1
Zinc and compounds	N	7440666		62	1
Zinc phosphide	N	1314847			
Zineb	N	12122677			

ATTACHMENT 5
LIST OF APPLICABLE PRACTICAL QUANTITATION LIMITS

APPLICABLE PRACTICAL QUANTITATION LIMITS (PQLs)

Notes:

Quantitation limits presented in this table are typical for the DNREC SOPCAP methods
Other methods may be available with quantitation limits lower than those presented
Analytes with no values presented require further PQL research - consult with DNREC for guidance

Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
Acetaldehyde	N	75070		0.2	556		
Acetochlor	N	34256821					
Acetone	N	67641		5	CLP	0.01	CLP
Acetonitrile	N	75078					
Acetophenone	N	98862	x				
Acrolein	N	107028					
Acrylamide	C	79061					
Acrylonitrile	C	107131	x				
Alachlor	C	15972608					
Alar	N	1596845					
Aldicarb	N	116063		3	531.1		
Aldicarb sulfone	N	1646884		4	531.1		
Aldrin	C	309002		.01	CLP	1.7	CLP
Aluminum	N	7429905		50	CLP	0.2	CLP
Aminodinitrotoluenes	N						
4-Aminopyridine	N	504245					
Aniline	N	62533					
Antimony and compounds	N	7440360		6	CLP	0.06	CLP
Antimony pentoxide	N	1314609					
Antimony tetroxide	N	1332316					
Antimony trioxide	N	1309644					
Arsenic (as carcinogen)	C	7440382		2	CLP	0.01	CLP
Assure	N	76578148					
Atrazine	C	1912249		1	505		
Azobenzene	C	103333					
Barium and compounds	N	7440393		200	CLP	0.2	CLP
Baygon	N	114261					
Baythroid	N	68359375					
Bentazon	N	25057890		1	515.3		
Benzaldehyde	N	100527	x	0.3	556		
Benzene	C	71432	x	1	CLP	0.01	CLP
Benzenethiol	N	108985					
Benzidine	C	92875					
Benzoic acid	N	65850					
Benzyl alcohol	N	100516					
Benzyl chloride	C	100447	x				
Beryllium and compounds	C	7440417		1	CLP	0.005	CLP
1,1-Biphenyl	N	92524					
Bis(2-chloroethyl)ether	C	111444	x	5	CLP	0.33	CLP
Bis(2-chloroisopropyl)ether	C	39638329	x				
Bis(chloromethyl)ether	C	542881	x				
Bis(2-ethylhexyl)phthalate (DEHP)	C	117817		5	CLP	0.33	CLP

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Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
Boron (and borates)	N	7440428					
Bromodichloromethane	C	75274	x	1	CLP	0.01	CLP
Bromoform (tribromomethane)	C	75252	x	1	CLP	0.01	CLP
Bromomethane	C	74839	x	1	CLP	0.01	CLP
Bromophos	N	2104963					
1-Butanol	N	71363					
N-Butylbenzene	N	104518	x	0.5	524.2		
Butyl benzyl phthalate	N	85687		5	CLP	0.33	CLP
Butylate	N	2008415					
sec-Butylbenzene	N	135988	x	0.5	524.2		
tert-Butylbenzene	N	104518	x	0.5	524.2		
Cadmium and compounds	N	7440439		1	CLP	0.005	CLP
Caprolactam	N	105602					
Carbaryl	N	63252		5	531.1		
Carbon disulfide	N	75150	x	1	CLP	0.01	CLP
Carbon tetrachloride	C	56235	x	1	CLP	0.01	CLP
Carbosulfan	N	55285148					
Chloral	N	75876					
Chloranil	C	118752					
Chlordane	C	57749		0.1	508		
Chlorine	N	7782505					
Chloroacetic acid	N	79118					
4-Chloroaniline	N	106478		5	CLP	0.33	CLP
Chlorobenzene	N	108907	x	1	CLP	0.01	CLP
Chlorobenzilate	C	510156					
p-Chlorobenzoic acid	N	74113					
2-Chloro-1,3-butadiene	N	126998	x				
1-Chlorobutane	N	109693	x				
Chloroethane	C	75003	x	1	CLP	0.01	CLP
Chloroform	C	67663	x	1	CLP	0.01	CLP
Chloromethane	C	74873	x	1	CLP	0.01	CLP
4-Chloro-2-methylaniline	C	95692					
beta-Chloronaphthalene	N	91587					
o-Chloronitrobenzene	C	88733	x				
p-Chloronitrobenzene	C	100005	x				
2-Chlorophenol	N	95578		5	CLP	0.33	CLP
o-Chlorotoluene	N	95498	x				
Chlorpyrifos	N	2921882					
Chlorpyrifos-methyl	N	5598130					
Chromium III and compounds	N	16065831		10	CLP	0.05	CLP
Chromium VI and compounds	N	18540299		1	CLP	0.02	CLP
Cobalt	N	7440484		50	CLP	0.05	CLP

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Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
Copper and compounds	N	7440508		25	CLP	0.02	CLP
Crotonaldehyde	C	123739		0.3	556		
Cumene	N	98828					
Cyanides:				10	CLP	0.01	CLP
Calcium cyanide	N	592018					
Copper cyanide	N	544923					
Cyanazine	C	21725462					
Cyanogen	N	460195					
Cyanogen bromide	N	506683					
Cyanogen chloride	N	506774					
Free cyanide	N	57125					
Hydrogen cyanide	N	74908					
Potassium cyanide	N	151508					
Potassium silver cyanide	N	506616					
Silver cyanide	N	506649					
Sodium cyanide	N	143339					
Thiocyanate	N	0					
Zinc cyanide	N	557211					
Cyclohexanone	N	108941	x	0.3	556		
Cyhalothrin/Karate	N	68085858					
Cypermethrin	N	52315078					
Dacthal	N	1861321		0.6	515.3		
Dalapon	N	75990		1	515.3		
DDD	C	72548		0.02	CLP	0.003	CLP
DDE	C	72559		0.02	CLP	0.003	CLP
DDT	C	50293		0.02	CLP	0.003	CLP
Diazinon	N	333415		0.25	525.2		
Dibenzofuran	N	132649		5	CLP	0.33	CLP
1,4-Dibromobenzene	N	106376	x				
Dibromochloromethane	C	124481	x	1	CLP	0.01	CLP
1,2-Dibromo-3-chloropropane	C	96128	x	1	CLP	0.01	CLP
1,2-Dibromoethane	C	106934	x	1	CLP	0.01	CLP
Dibutyl phthalate	N	84742					
Dicamba	N	1918009		0.3	515.2		
1,2-Dichlorobenzene	N	95501	x	1	CLP	0.33	CLP
1,3-Dichlorobenzene	N	541731	x	1	CLP	0.33	CLP
1,4-Dichlorobenzene	C	106467	x	1	CLP	0.33	CLP
3,3'-Dichlorobenzidine	C	91941		5	CLP	0.33	CLP
Dichlorodifluoromethane (Freon 12)	N	75718	x	1	524.2		
1,1-Dichloroethane	N	75343	x	1	CLP	0.01	CLP
1,2-Dichloroethane (EDC)	C	107062	x	1	CLP	0.01	CLP
1,1-Dichloroethylene	C	75354	x	1	CLP	0.01	CLP

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Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
1,2-Dichloroethylene (cis)	N	156592	x	1	CLP	0.01	CLP
1,2-Dichloroethylene (trans)	N	156605	x	1	CLP	0.01	CLP
2,4-Dichlorophenol	N	120832		5	CLP	0.33	CLP
2,4-Dichlorophenoxyacetic Acid (2,4-D)	N	94757	x	0.35	515.3		
4-(2,4-Dichlorophenoxy)butyric Acid	N	94826		1	515.3		
1,2-Dichloropropane	C	78875	x	1	CLP	0.01	CLP
2,3-Dichloropropanol	N	616239					
1,3-Dichloropropene	C	542756	x	1	CLP	0.01	CLP
Dichlorvos	C	62737					
Dicofol	C	115322					
Dicyclopentadiene	N	77736	x				
Dieldrin	C	60571		0.02	CLP	0.003	CLP
Diethyl phthalate	N	84662		5	CLP	0.33	CLP
Diethylene glycol, monoethyl ether	N	111900					
Di(2-ethylhexyl)adipate	C	103231		5	525.2		
Diethylstilbestrol	C	56531					
Difenzoquat (Avenge)	N	43222486					
Diisopropyl methylphosphonate (DIMP)	N	1445756					
3,3'-Dimethoxybenzidine	C	119904					
2,4-Dimethylaniline hydrochloride	C	21436964					
2,4-Dimethylaniline	C	95681					
N-N-Dimethylaniline	N	121697					
3,3'-Dimethylbenzidine	C	119937					
1,1-Dimethylhydrazine	C	57147					
1,2-Dimethylhydrazine	C	540738					
2,4-Dimethylphenol	N	105679		5	CLP	0.33	CLP
2,6-Dimethylphenol	N	576261					
3,4-Dimethylphenol	N	95658					
Dimethyl phthalate	N	131113		5	CLP	0.33	CLP
1,2-Dinitrobenzene	N	528290					
1,3-Dinitrobenzene	N	99650					
1,4-Dinitrobenzene	N	100254					
4,6-Dinitro-o-cyclohexyl phenol	N	131895					
4,6-Dinitro-2-Methylphenol	N	534521		20	CLP	0.83	CLP
2,4-Dinitrophenol	N	51285		20	CLP	0.83	CLP
Dinitrotoluene Mix	C						
2,4-Dinitrotoluene	N	121142		5	CLP	0.33	CLP
2,6-Dinitrotoluene	N	606202		5	CLP	0.33	CLP
Dinoseb	N	88857		2	515.2		
di-n-Octyl phthalate	N	117840		5	CLP	0.33	CLP
1,4-Dioxane	C	123911					
Diphenylamine	N	122394					

APPLICABLE PRACTICAL QUANTITATION LIMITS (PQLs)

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Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
1,2-Diphenylhydrazine	C	122667					
Diquat	N	85007					
Disulfoton	N	298044					
1,4-Dithiane	N	505293					
Diuron	N	330541					
Endosulfan	N	115297		0.01	CLP	0.003	CLP
Endrin	N	72208		0.02	CLP	0.003	CLP
Epichlorohydrin	C	106898					
Ethion	N	563122					
2-Ethoxyethanol	N	110805					
Ethyl acetate	N	141786					
Ethylbenzene	N	100414	x	1	CLP	0.01	CLP
Ethylene diamine	N	107153					
Ethylene glycol	N	107211					
Ethylene oxide	C	75218					
Ethylene thiourea (ETU)	C	96457		5	509		
Ethyl ether	N	60297	x				
Ethyl methacrylate	N	97632					
Fenamiphos	N	22224926					
Fluometuron	N	2164172					
Fluoride	N	7782414					
Fomesafen	C	72178020					
Fonofos	N	944229					
Formaldehyde	N	50000		0.3	556		
Formic Acid	N	64186					
Furan	N	110009					
Furazolidone	C	67458					
Furfural	N	98011					
Glycidaldehyde	N	765344					
Glyphosate	N	1071836					
HCH (alpha)	C	319846		0.01	CLP	0.002	CLP
HCH (beta)	C	319857		0.01	CLP	0.002	CLP
HCH (gamma) Lindane	C	58899		0.01	CLP	0.002	CLP
HCH-technical	C	608731		0.01	CLP		
Heptachlor	C	76448	x	0.01	CLP	0.002	CLP
Heptachlor epoxide	C	1024573	x	0.01	CLP	0.002	CLP
Hexabromobenzene	N	87821	x				
Hexachlorobenzene	C	118741	x	1	CLP	0.33	CLP
Hexachlorobutadiene	C	87683	x	1	CLP	0.33	CLP
Hexachlorocyclopentadiene	N	77474	x	1	CLP	0.33	CLP
Hexachlorodibenzo-p-dioxin mixture	C	19408743					
Hexachloroethane	C	67721	x	5	CLP	0.33	CLP

APPLICABLE PRACTICAL QUANTITATION LIMITS (PQLs)

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Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
Hexachlorophene	N	70304					
n-Hexane	N	110543	x				
2-Hexanone	N	591786		5	CLP	0.33	CLP
Hexazinone	N	51235042					
HMX	N	2691410					
Hydrazine, hydrazine sulfate	C	302012					
Hydrogen sulfide	N	7783064					
Hydroquinone	N	123319					
Iron	N	7439896		100	CLP	0.1	CLP
Isobutanol	N	78831	x				
Isophorone	C	78591		5	CLP	0.33	CLP
Isopropalin	N	33820530					
Isopropyl methyl phosphonic acid	N	1832548					
Lead	N	7439921		3	CLP	0.003	CLP
Lithium	N	7439932					
Malathion	N	121755					
Maleic anhydride	N	108316					
Manganese and compounds	N	7439965		15	CLP	0.15	CLP
Mephosfolan	N	950107					
Mepiquat chloride	N	24307264					
Mercuric chloride	N	7487947					
Mercury (inorganic)	N	7439976		0.2	CLP	0.002	CLP
Mercury (methyl)	N	22967926					
Methacrylonitrile	N	126987					
Methanol	N	67561					
Methidathion	N	950378					
Methoxychlor	N	72435		0.1	CLP	0.017	CLP
Methyl acetate	N	79209					
Methyl acrylate	N	96333					
2-Methylaniline	C	95534					
4-(2-Methyl-4-chlorophenoxy) butyric acid	N	94815					
2-Methyl-4-chlorophenoxyacetic acid	N	94746					
2-(2-Methyl-14-chlorophenoxy)propionic acid	N	93652					
Methylene bromide	N	74953	x				
Methylene chloride	C	75092	x	2	CLP	0.01	CLP
4,4'-Methylene bis(2-chloroaniline)	C	101144					
4,4'-Methylene bis(N,N'-dimethyl)aniline	C	101611					
Methyl ethyl ketone	N	78933	x				
Methyl hydrazine	C	60344					
Methyl isobutyl ketone	N	108101					
Methyl methacrylate	N	80626					
2-Methyl-5-nitroaniline	C	99558					

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Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
Methyl parathion	N	298000					
2-Methylphenol (o-cresol)	N	95487		5	CLP	0.33	CLP
3-Methylphenol (m-cresol)	N	103394		5	CLP	0.33	CLP
4-Methylphenol (p-cresol)	N	106445		5	CLP	0.33	CLP
Methyl styrene (mixture)	N	25013154	x				
Methyl styrene (alpha)	N	98839	x				
Methyl tertbutyl ether (MTBE)	N	1634044	x				
Metolaclor (Dual)	N	51218452					
Mirex	C	2385855					
Molybdenum	N	7439987					
Monochloramine	N	10599903					
Naled	N	300765					
Nickel and compounds	N	7440020		10	CLP	0.04	CLP
Nitrate	N	14797558					
Nitric oxide	N	10102439					
Nitrite	N	14797650					
2-Nitroaniline	N	88744		20	CLP	0.83	CLP
Nitrobenzene	N	98953	x	5	CLP	0.33	CLP
Nitrofurantoin	N	67209					
Nitrofurazone	C	59870					
Nitrogen dioxide	N	10102440					
Nitroglycerin	C	55630					
4-Nitrophenol	N	100027		1	515.3	0.83	CLP
N-Nitrosodi-n-butylamine	C	924163					
N-Nitrosodiethanolamine	C	1116547					
N-Nitrosodiethylamine	C	55185					
N-Nitrosodimethylamine	C	62759					
N-Nitrosodiphenylamine	C	86306		5	CLP	0.33	CLP
N-Nitroso di-n-propylamine	C	621647		5	CLP	0.33	CLP
N-Nitroso-N-ethylurea	C	759739					
N-Nitroso-N-methylethylamine	C	10595956					
N-Nitrosopyrrolidine	C	930552					
m-Nitrotoluene	N	99081	x				
o-Nitrotoluene	N	88722	x				
p-Nitrotoluene	N	99990	x				
NuStar	N	85509199					
Oryzalin	N	19044883					
Oxadiazon	N	19666309					
Oxamyl	N	23135220		20	531.1		
Oxyfluorfen	N	42874033					
Paraquat	N	1910425					
Parathion	N	56382					

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Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
Pentachlorobenzene	N	608935	x				
Pentachloronitrobenzene	C	82688	x				
Pentachlorophenol	C	87865		0.2	CLP	0.83	CLP
Permethrin	N	52645531					
Petroleum Hydrocarbons							
C5 through C8 Aliphatic Hydrocarbons		n/a					
C9 through C12 Aliphatic Hydrocarbons		n/a					
C9 through C18 Aliphatic Hydrocarbons		n/a					
C19 through C36 Aliphatic Hydrocarbons		n/a					
C9 through C10 Aromatic Hydrocarbons		n/a					
C11 through C22 Aromatic Hydrocarbons		n/a					
Phenol	N	108952		5	CLP	0.33	CLP
m-Phenylenediamine	N	108452					
o-Phenylenediamine	C	95545					
p-Phenylenediamine	N	106503					
2-Phenylphenol	C	90437					
Phosphine	N	7803512					
Phosphorus (white)	N	7723140					
p-Phthalic acid	N	100210					
Phthalic anhydride	N	85449					
Polybrominated biphenyls	C	0					
Polychlorinated biphenyls (PCBs)	C	1336363					
Aroclor 1016	N	12674112		0.2	CLP	0.033	CLP
Aroclor 1221	C	11104282		0.4	CLP	0.067	CLP
Aroclor 1232	C	11141165		0.2	CLP	0.033	CLP
Aroclor 1242	C	53469219		0.2	CLP	0.033	CLP
Aroclor 1248	C	12672296		0.2	CLP	0.033	CLP
Aroclor 1254	N	11097691		0.2	CLP	0.033	CLP
Aroclor 1260	C	11096825		0.2	CLP	0.033	CLP
Polychlorinated terphenyls (PCTs)	C	0					
Polynuclear aromatic hydrocarbons							
Acenaphthene	N	83329		1	CLP	0.33	CLP
Anthracene	N	120127		1	CLP	0.33	CLP
Benzo[a]anthracene	C	56553		1	CLP	0.33	CLP
Benzo[b]fluoranthene	C	205992		1	CLP	0.33	CLP
Benzo[k]fluoranthene	C	207089		1	CLP	0.33	CLP
Benzo[a]pyrene	C	50328		0.1	CLP	0.33	CLP
Carbazole	C	86748		1	CLP	0.33	CLP
Chrysene	C	218019		1	CLP	0.33	CLP
Dibenz[ah]anthracene	C	53703		1	CLP	0.33	CLP
Fluoranthene	N	206440		1	CLP	0.33	CLP
Fluorene	N	86737		1	CLP	0.33	CLP

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Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
Indeno[1,2,3-cd]pyrene	C	193395		1	CLP	0.33	CLP
2-Methylnaphthalene	N	91576		1	CLP	0.33	CLP
Naphthalene	N	91203		1	CLP	0.33	CLP
Pyrene	N	129000		1	CLP	0.33	CLP
N-Propylbenzene	N			0.5	524.2		
Prometon	N	1610180					
Prometryn	N	7287196					
Propachlor	N	1918167					
Propanil	N	709988		0.4	556		
Propargite	N	2312358					
Propylene glycol	N	57556					
Propylene glycol, monoethyl ether	N	52125538					
Propylene glycol, monomethyl ether	N	107982					
Pursuit	N	81335775					
Pyridine	N	110861					
Quinoline	C	91225					
RDX	C	121824					
Resmethrin	N	10463868					
Ronnel	N	299843					
Rotenone	N	83794					
Selenious Acid	N	7783008					
Selenium	N	7782492		5	CLP	0.005	CLP
Silver and compounds	N	7440224		10	CLP	0.01	CLP
Simazine	C	122349		1	525.2		
Sodium azide	N	26628228					
Sodium diethyldithiocarbamate	C	148185					
Strontium, stable	N	7440246					
Strychnine	N	57249					
Styrene	N	100425	x	1	CLP	0.01	CLP
2,3,7,8-TCDD (dioxin)	C	1746016		0.000005	1613		
1,2,4,5-Tetrachlorobenzene	N	95943	x	1			
1,1,1,2-Tetrachloroethane	C	630206	x	0.5	524.2		
1,1,2,2-Tetrachloroethane	C	79345	x	1	CLP	0.01	CLP
Tetrachloroethylene (PCE)	C	127184	x	1	CLP	0.01	CLP
2,3,4,6-Tetrachlorophenol	N	58902					
p,a,a,a-Tetrachlorotoluene	C	5216251	x				
Tetraethyl lead	N	78002					
Tetryl	N	479458					
Thallic oxide	N	1314325					
Thallium	N	7440280		1	CLP	0.01	CLP
Thallium acetate	N	563688					
Thallium carbonate	N	6533739					

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Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
Thallium chloride	N	7791120					
Thallium nitrate	N	10102451					
Thallium sulfate	N	7446186					
Thiobencarb	N	28249776					
Tin and compounds	N	7440315					
Titanium	N	7440326					
Titanium Dioxide	N	13463677					
Toluene	N	108883	x	1	CLP	0.01	CLP
Toluene-2,4-diamine	C	95807					
Toluene-2,5-diamine	N	95705					
Toluene-2,6-diamine	N	823405					
p-Toluidine	C	106490					
Toxaphene	C	8001352		1	CLP	0.17	CLP
1,2,4-Tribromobenzene	N	615543	x				
Tributyltin oxide (TBTO)	N	56359					
2,4,6-Trichloroaniline	C	634935					
1,2,4-Trichlorobenzene	N	120821	x	1	CLP	0.01	CLP
1,1,1-Trichloroethane	N	71556	x	1	CLP	0.01	CLP
1,1,2-Trichloroethane	C	79005	x	1	CLP	0.01	CLP
Trichloroethylene (TCE)	C	79016	x	1	CLP	0.01	CLP
Trichlorofluoromethane	N	75694	x				
2,4,5-Trichlorophenol	N	95954		20	CLP	0.83	CLP
2,4,6-Trichlorophenol	C	88062		5	CLP	0.33	CLP
2,4,5-Trichlorophenoxyacetic acid	N	93765					
2-(2,4,5-Trichlorophenoxy)propionic acid	N	93721					
1,1,2-Trichloropropane	N	598776	x				
1,2,3-Trichloropropane	C	96184	x				
1,2,3-Trichloropropene	N	96195	x				
1,1,2-Trichloro-1,2,2- trifluoroethane	N	76131	x				
1,2,4-Trimethylbenzene	N	95636	x				
1,3,5-Trimethylbenzene	N	108678	x				
Trimethyl phosphate	C	512561					
1,3,5-Trinitrobenzene	N	99354					
2,4,6-Trinitrotoluene	C	118967					
Uranium (soluble salts)	N	7440611					
Vanadium	N	7440622		50	CLP	0.05	CLP
Vanadium pentoxide	N	1314621					
Vanadium sulfate	N	36907423					
Vinclozolin	N	50471448					
Vinyl acetate	N	108054					
Vinyl chloride	C	75014	x	1	CLP	0.01	CLP
Warfarin	N	81812					

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Contaminant		CAS	VOC	Water PQL (ug/l)	Method	Soil PQL (mg/kg)	Method
m-Xylene	N	108323	x				
o-Xylene	N	95476	x				
p-Xylene	N	106423	x				
Xylene (mixed)	N	1330207	x	1	CLP	0.01	CLP
Zinc and compounds	N	7440666		20	CLP	0.02	CLP
Zinc phosphide	N	1314847					
Zineb	N	12122677					