BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

PROPOSED AMENDMENTS TO TIERED APPROACH TO CORRECTIVE ACTION OBJECTIVES (35 Ill. Adm. Code 742)

R09- 009
(Rulemaking-Land)

ORIGINAL

NOTICE

Dorothy Gunn, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 W. Randolph, Suite 11-500
Chicago, Illinois 60601
(Via First Class Mail)

Bill Richardson
Chief Legal Counsel
Illinois Dept. of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271
(Via First Class Mail)

Matt Dunn
Environmental Bureau Chief
Office of the Attorney General
James R. Thompson Center
100 W. Randolph, 12th Floor
Chicago, Illinois 60601
(Via First Class Mail)

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board the Illinois Environmental Protection Agency's ("Illinois EPA") Motion for Acceptance, Appearance of Attorney, Certification of Origination, Motion for Leave from Filing Requirement, List of Studies and Reports Used in Regulatory Development, Statement of Reasons, and the Proposed Amendments a copy of each of which is herewith served upon you.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

By: Kimberly A. Geving

Kimberly A. Geving
Assistant Counsel
Division of Legal Counsel

DATE: September 2, 2008

1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217)782-5544

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	R09- 09
PROPOSED AMENDMENTS TO	)	(Rulemaking-Land)
TIERED APPROACH TO CORRECTIVE	)	
ACTION OBJECTIVES	)	
(35 Ill. Adm. Code 742)	)	
	)	

ORIGINAL

MOTION FOR ACCEPTANCE

NOW COMES the Illinois Environmental Protection Agency ("Illinois EPA") and, pursuant to 35 Ill. Adm. Code 102.106, 102.200, and 102.202, moves the Illinois Pollution Control Board ("Board") to accept the Illinois EPA's proposal for hearing. This regulatory proposal includes: 1) the Appearance for the attorney representing the Illinois EPA; 2) Certification of Origination; 3) the Statement of Reasons; and 4) the Proposed Amendments.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: Douglas P. Scott
Douglas P. Scott
Director

DATE: August 6, 2008

1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217)782-3397

THIS FILING SUBMITTED ON RECYCLED PAPER

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	R09- 609
PROPOSED AMENDMENTS TO	)	(Rulemaking-Land)
TIERED APPROACH TO CORRECTIVE	)	
ACTION OBJECTIVES	)	
(35 Ill. Adm. Code 742)	)	

ORIGINAL

APPEARANCE

The undersigned, as one of its attorneys, hereby enters her entry of Appearance on behalf of the Illinois Environmental Protection Agency.

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: _____
Kimberly A. Geving
Assistant Counsel
Division of Legal Counsel

DATE: September 2, 2008

1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217)782-5544

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	R09- 9
PROPOSED AMENDMENTS TO	)	(Rulemaking-Land)
TIERED APPROACH TO CORRECTIVE	)	
ACTION OBJECTIVES	)	
(35 Ill. Adm. Code 742)	)	
	)	

CERTIFICATION OF ORIGINATION

NOW COMES the Illinois Environmental Protection Agency ("Illinois EPA") and, pursuant to 35 Ill. Adm. Code 102.202(i), certifies that this proposal for amendments to 35 Ill. Adm. Code 742 amends the most recent version of that rule as published on the Illinois Pollution Control Board's website.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: _____
Kimberly A. Geving
Assistant Counsel

DATE: September 2, 2008

1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217)782-5544

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PROPOSED AMENDMENTS TO	)	R09-9
TIERED APPROACH TO CORRECTIVE	)	(Rulemaking-Land)
ACTION OBJECTIVES	)	
(35 Ill. Adm. Code 742)	)	
	)	

MOTION FOR LEAVE FROM FILING REQUIREMENT

NOW COMES the Illinois Environmental Protection Agency ("Illinois EPA") and, pursuant to 35 Ill. Adm. Code 101.500, moves the Illinois Pollution Control Board ("Board") to waive the filing requirement pursuant to 35 Ill. Adm. Code 101.306(a) for two of the Illinois EPA's amended Incorporations by Reference.

In support of its motion, the Illinois EPA asserts, and the Board has confirmed, that the titles for which this motion seeks relief from the filing requirement are already in the Board's possession. Additionally, they are voluminous, multiple volume documents that would be unduly burdensome and costly to copy.

WHEREFORE, the Illinois EPA seeks relief from the filing requirement for the following titles: (1) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," USEPA Publication No. SW-846, as amended by Updates I, II, IIA, IIB, III, IIIA, and IIIB, prepared by USEPA and available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 or online at http://www.epa.gov/epaoswer/hazwaste/test/main.htm ; and (2) United States Environmental Protection Agency, CFR Promulgated Test Methods, Method 3C, "Determination of Carbon Dioxide, Methane, Nitrogen, and Oxygen from Stationary

Sources" and Method 16, "Semicontinuous Determination of Sulfur Emissions from Stationary Sources," Technology Transfer Network, Emission Measurement Center, (2007) available online at http://www.epa.gov/ttn/emc/promgate.html.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: _____
Kimberly A. Geving
Assistant Counsel
Division of Legal Counsel

DATED: September 2, 2008

1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

List of Studies and Reports Used in Regulatory Development

American Petroleum Institute (Nov. 2005). A Practical Strategy for Assessing the Subsurface Vapor-to-Indoor-Air Migration Pathway at Petroleum Hydrocarbon Sites. API Publication 4741. http://www.itrcweb.org/Documents/VI-1.pdf

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California EPA, Department of Toxic Substances Control (Jan. 2003). Advisory on Active Soil Gas Investigations. http://www.dtsc.ca.gov/lawsregspolicies/policies/SiteCleanup/upload/SMBR_ADV_activesoilgasinvst.pdf

Colorado Department of Public Health and Environment (Sept. 2004). Draft Indoor Air Guidance. http://www.cdphe.state.co.us/HM/indoorair.pdf

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Folkes, D. (Dec 2002). Design, Effectiveness, and Reliability of Sub-Slab Depressurization Systems for Mitigation of Chlorinated Solvent Vapor Intrusion. EnviroGroup Limited. Presented at the U.S. EPA Seminar on Indoor Air Vapor Intrusion, San Francisco. http://www.envirogroup.com/publications/folkes_epa_seminar.pdf

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International Building Code (2006). Available at the Illinois EPA library upon request.

Kremesec, V., Hopkins, H. and Thun, R. (Feb. 2005). A View of the Evaluation of the Vapor Intrusion Pathway from Within the Petroleum Industry. EM Magazine, Air and Waste Management Association. http://www.astswmo.org/files/publications/tanks/2005SoilVaporMonitoringWorkshop/Evaluation-of-Vapor-Intrusion-Pathway-Kremesec.pdf

Lyman, W. and Reehl, W. (1990). Handbook of Chemical Property Estimation Methods. Available at the Illinois EPA library, Call Number: 547.3 LYMA 1990.

McHugh, T., Connor, J., & Ahmad, F. (Mar. 2005). An Empirical Analysis of the Groundwater-to-Indoor-Air Exposure Pathway: The Role of Background Concentrations in Indoor Air. Environmental Forensics, Vol. 5, No. 2. http://www.gsi-net.com/Publications /McHugh_GW-Air_2004.pdf

Missouri Department of Natural Resources (April 2005). Missouri Risk-Based Corrective Action for Petroleum Storage Tanks: Soil Gas Sampling Protocol. http://www.dnr.mo.gov/env/hwp/tanks/docs/soil-gas-protocol-2005-04-21.pdf

New Hampshire Department of Environmental Services (April 2005). Draft Vapor Intrusion Guidance. http://www.des.state.nh.us/ORCB/doclist/pdf/vapor_intrusion.pdf

New Jersey Department of Environmental Protection (June 2005). Draft Vapor Intrusion Guidance. http://www.state.nj.us/dep/srp/guidance/vaporintrusion/vig.htm

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http://www.brownfieldstsc.org/pdfs/BTSC%20Vapor%20Intrusion%20Considerations%20for%20Redevelopment%20EPA%20542-R-08-001.pdf

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PROPOSED AMENDMENTS TO	)	R09- 9
TIERED APPROACH TO CORRECTIVE	)	(Rulemaking-Land)
ACTION OBJECTIVES	)	
(35 Ill. Adm. Code 742)	)	

STATEMENT OF REASONS

The Illinois Environmental Protection Agency ("Illinois EPA") hereby submits its Statement of Reasons for the above-captioned matter to the Illinois Pollution Control Board ("Board") pursuant to Section 27 of the Illinois Environmental Protection Act ("Act")(415 ILCS 5/27) and 35 Ill. Adm. Code 102.200 and 102.202.

I. FACTS IN SUPPORT, PURPOSE, AND EFFECT

A. Background

On December 15, 1995, P.A. 89-431 (which added a new Title XVII to the Act) was signed into law by Governor Edgar. Pursuant to Section 58.11(c) of the Act, Illinois EPA proposed regulations prescribing procedures and standards for the Illinois EPA's administration of its duties under Title XVII. That proposal became known as the Tiered Approach to Corrective Action Objectives ("TACO") under 35 Ill. Adm. Code 742, which established a system whereby sites undergoing remediation in the Site Remediation Program ("SRP"), the Leaking Underground Storage Tank ("LUST") Program, and RCRA Part B Permits and Closures could use the methodology set forth in the TACO rules to determine remediation objectives. Since the inception of the initial rulemaking, TACO's applicability has been expanded outside the three programs listed above.

Part 742 established procedures for developing remediation objectives based on various risks to human health posed by environmental conditions at a site. Because human health may be

impacted by any type of environmental contamination, whether it originates from petroleum, metals, or some other type of waste, it was logical to create a single set of procedures that any of the land remediation programs could use to address contamination at any given site. What resulted was the TACO methodology, whereby risks posed to human health are evaluated, site conditions are assessed, and individuals propose remediation objectives to mitigate conditions at the site so that they no longer pose a threat to human health.

The Board adopted TACO on June 5, 1997 (with three sub-dockets being adopted shortly thereafter). In May of 2000, Illinois EPA proposed amendments to TACO that were necessitated by new technology, science, and programmatic changes. The Board adopted those amendments in December of 2000, with two sub-dockets being adopted shortly thereafter. In 2002 and again in 2005, the Board adopted additional amendments to TACO for the purpose of keeping the TACO procedures and requirements current and to improve standards and procedures so that end users of the rules can achieve accurate data results that are protective of human health.

The new amendments propose to add the indoor inhalation exposure route to the existing risk-based methodology. The indoor inhalation pathway will be managed similarly to the current exposure routes under TACO. It follows the basic framework of TACO's three tiers, calculates both residential and industrial/commercial remediation objectives, and allows for pathway exclusion.

Individuals will assess indoor inhalation exposure using collected soil and groundwater or soil gas data and then apply a modified Johnson and Ettinger (J&E) model to develop remediation objectives. The modified J&E model simulates the migration of contaminants from a subsurface source to the air inside a building. Additional equations are presented that calculate acceptable soil, groundwater and soil gas remediation objectives. This modified J&E model used

in TACO contains 18 equations and 56 parameters. Like the Soil Screening Level ("SSL") and Risk Based Corrective Action ("RBCA") models used for other exposure routes, modified J&E model parameters have conservative default values under Tier 1 that can be substituted for site-specific conditions under Tier 2. Tier 3 allows the use of subslab soil gas data to establish remediation objectives. A new Subpart L provides requirements for building control technologies to mitigate the potential for contaminated soil gas to enter the indoor air, an approach similar to engineered barriers under Subpart K.

The effect of the proposed amendments is to protect building occupants from volatile chemicals that have the potential to migrate from the soil and groundwater to indoor air. This migration process has been colloquially referred to as "vapor intrusion."

There is no legislative or regulatory requirement to propose these amendments. Illinois EPA wants to broaden the exposure routes evaluated so as to fully protect public health from contaminated sites and to add more certainty to the release of liability provided by the No Further Remediation determination.

Until now, Illinois EPA has evaluated vapor intrusion on a limited scale, when major indoor inhalation risks are suspected; case studies of these experiences will be submitted to the Board by Illinois EPA as part of its testimony. U.S. EPA recommends screening all sites that have the potential to cause indoor inhalation health risks. Other States have experienced public health crises and ensuing legal and financial challenges caused by vapor intrusion exposures at sites where the indoor inhalation pathway was not evaluated as part of the regulatory cleanup prior to issuance of the No Further Remediation letter or its equivalent. In March 2008, ASTM International issued its *Standard Practice for Assessment for Vapor Intrusion into Structures on Property Involved in Real Estate Transactions*. Section 9.2.2 of the Standard instructs users to

apply State generic risk-based concentrations. Illinois EPA's amendments would establish such numbers.

The amendments also propose to update remediation objectives for all of the exposure routes and their corresponding populations: residential, industrial/commercial and construction worker. These changes are needed to keep the rule current with the scientific literature and protective of human health.

B. Regulatory Development

Illinois EPA convened an internal workgroup to create a methodology for evaluating the indoor inhalation pathway that would be compatible with and integrated into the existing TACO regulations. The workgroup began by reviewing the draft vapor intrusion guidance prepared by U.S. EPA and state-specific guidance prepared by New Jersey, New York, Pennsylvania, Missouri and Colorado, among others. Illinois EPA also retained the services of the RAM Group, a subcontractor with expert knowledge in contaminant fate and transport.

On May 25, 2007, Illinois EPA sent a first working draft of the proposed amendments to the chairperson of the Site Remediation Advisory Committee ("SRAC") for distribution to its members and the regulated community. After they had ample opportunity to review and comment, Illinois EPA met with SRAC members to discuss their comments and suggestions. Those meetings occurred on August 27, 2007; September 27, 2007; November 2, 2007; and February 6, 2008. On May 23, 2008, Illinois EPA sent a revised draft to SRAC addressing the many issues raised by SRAC in writing and in meetings. On June 19, 2008, Illinois EPA met with SRAC to discuss the May 2008 version. That meeting resulted in additional changes which are now reflected in the proposal filed with the Board. Illinois EPA appreciates the comments,

issues and concerns raised by SRAC and the regulated community. Their thoughtfulness and thoroughness significantly improved the Agency's proposal.

Affected Sources and Facilities and Economic Impact

Persons (as defined in Section 58.2 of the Act) affected by this rule include any and all persons undergoing remediation who are entitled to use a risk-based methodology for determining remediation objectives. Such persons would include, but not necessarily be limited to, those conducting remediation under the SRP, the LUST Program, RCRA Part B permits and closures, or other Illinois EPA remediation programs.

The use of TACO in conjunction with various program regulations has accomplished the goal of putting many sites back into safe, productive use while significantly decreasing remediation expenses statewide.

C. Environmental, Technical, and Economic Justification

The original SSL and RBCA models from which TACO evolved included the indoor inhalation exposure route. Back in 1997, when TACO was first adopted, Illinois EPA omitted the indoor inhalation exposure route intentionally, due to a lack of confidence in the existing scientific data. Ten years later, research gaps have narrowed substantially and Illinois EPA has been able to calculate soil, groundwater and soil gas remediation objectives for indoor inhalation using generally accepted modeling equations.

The proposed indoor inhalation amendments will increase the cost of some site cleanups but will bring three important benefits. First, Illinois residents will be better protected from volatile chemicals migrating from contaminated sites. Second, site owners or other remediation applicants will receive expanded liability relief through issuance of a No Further Remediation letter that takes the indoor inhalation exposure route into account. Third, establishing

remediation objectives for the indoor inhalation pathway will facilitate property transactions. The benefit to the public should outweigh any additional remediation costs.

The extent of the anticipated cost increases is unknown and expected to vary widely depending on site and contaminant characteristics and the willingness of affected property owner(s) to accept building control technologies and institutional controls.

To further ease implementation of the new indoor inhalation pathway, the internal agency workgroup is preparing a guidance document containing detailed information on how to manage the exposure route under TACO's three tiers.

II. THE PROPOSED AMENDMENTS

Inserting a new exposure route into TACO requires comprehensive changes to the existing regulations. As would be expected, these proposed amendments contain new definitions, equations, parameters, default remediation objectives, and mechanisms for managing the indoor inhalation pathway. What follows is a general overview of the changes proposed.

A. Subpart A

Illinois EPA proposes language in Sections 742.110 and 742.115 to account for the inclusion of the modified J&E model and the indoor inhalation exposure route, respectively.

B. Subpart B

Amendments to Subpart B include: adding definitions for "Building," "Building Control Technology," "Volatile Chemicals," "Soil Gas," and "Soil Vapor Saturation Limit"; adding new incorporations by reference; adding an exception in Section 742.225(b)(5) stating that compositing and averaging of sample results are prohibited under the indoor inhalation exposure route, except as approved by the Agency in Tier 3; and adding new Sections 742.222 and

742.227 to allow for the use of soil gas data when determining remediation objectives for the indoor inhalation exposure route.

C. Subpart C

Illinois EPA inserted "Outdoor" before "Inhalation Exposure Route" in Section 742.310 and added Section 742.312 that states when the indoor inhalation exposure route may be excluded from consideration. As part of Section 742.312, the pathway may be excluded by use of a building control technology that meets the requirements of Subpart L.

D. Subpart E

Illinois EPA added Section 742.515, which explains how to use the Tier 1 indoor inhalation remediation objectives for soil gas, soil and groundwater in Appendix B, Table G. Under the indoor inhalation pathway, unless the route is excluded from consideration under Subpart C, site evaluators must demonstrate compliance with either: 1) soil and groundwater, or 2) soil gas.

E. Subpart F

Illinois EPA modified Section 742.600 to state that a calculated Tier 2 indoor inhalation remediation objective for soil cannot exceed the soil saturation limit and that a corresponding remediation objective for soil gas cannot exceed the soil vapor saturation limit.

F. Subpart G

Amendments to Subpart G include: changing Section 742.700(g) to exclude the construction worker population from the indoor inhalation exposure route; adding Section 742.717 to require use of the modified J&E model and to explain how the J&E equations for soil and soil gas data are to be applied; and under Sections 742.717(i) and (j), describing when the

soil saturation limit and the soil vapor saturation limit are to be used as the soil and soil gas remediation objectives, respectively.

G. Subpart H

Amendments to Subpart H include: adding Section 742.805(e) to require individuals to use Section 742.812 when developing Tier 2 groundwater remediation objectives for the indoor inhalation exposure route; and adding Section 742.812 to explain how the J&E equations are to be used for developing groundwater remediation objectives.

H. Subpart I

Amendments to Subpart I include: adding Section 742.935(a) to allow exposure route exclusion (as an alternative to Section 742.312) for the indoor inhalation exposure route; adding Section 742.935(b) to allow the use of soil gas data (as an alternative to Section 742.227) to establish remediation objectives for the indoor inhalation exposure route; adding Section 742.935(c) to allow the use of building control technologies (as an alternative to those described in Subpart L) as a means to prevent or mitigate human exposures under the indoor inhalation exposure route; and adjusting language elsewhere in this Subpart to account for this new Section.

I. Subpart J

Illinois EPA added Section 742.1000(a)(7) to require the use of institutional controls whenever remediation objectives are based on a building control technology. New Section 742.1015(j) states that a groundwater ordinance may not be used to exclude the indoor inhalation exposure route. This is because an ordinance restricting the source of drinking water would be incapable of protecting the enclosed air space of a building from the migration of contaminants in the groundwater.

J. Subpart L

Illinois EPA created this subpart to provide requirements for four types of building control technologies: sub-slab depressurization systems, sub-membrane depressurization systems, membrane barrier systems, and barriers created from geologic materials.

K. Appendix A, Table A

Illinois EPA updated the soil saturation limits due to revised chemical and physical properties and added a column to distinguish between the outdoor inhalation exposure route and the soil component of the groundwater ingestion exposure route. The difference in values is based on the fraction of organic carbon content (f_{oc}). Three footnotes have also been added.

L. Appendix A, Table E

Illinois EPA added fifteen chemicals based on the proposed Groundwater Quality Standards (35 Ill. Adm. Code Part 620). The entire table has been alphabetized by target organ.

M. Appendix A, Table F

Illinois EPA added fifteen chemicals based on the proposed Groundwater Quality Standards (35 Ill. Adm. Code Part 620). The entire table has been alphabetized by target organ.

N. Appendix A, Table I

Illinois EPA added six new chemicals and updated some of the Acceptable Detection Limits ("ADLs"). Some of the toxicity values changed, resulting in changes to the Class I Groundwater Remediation Objectives and the 1 in 1,000,000 Cancer Risk Concentration.

O. Appendix A, Table J

This is a new table identifying the 59 TACO volatile chemicals that are considered contaminants of concern for the indoor inhalation exposure route.

P. Appendix A, Table K

This is a new table identifying the soil vapor saturation limits for the volatile

chemicals of concern for the indoor inhalation exposure route.

Q. Appendix A, Table L

This is a new table identifying the soil saturation limits for volatile chemicals for the indoor inhalation exposure route. A separate table is needed because the calculation of saturation limits for the indoor inhalation pathway uses parameter values different than those used to create Appendix A, Table A (i.e., fraction organic carbon content and system temperature).

R. Appendix B, Table A

Illinois EPA updated remediation objectives for all exposure routes using the most current toxicity values and physical and chemical parameter values. We also updated the previously titled "Inhalation" column to "Outdoor Inhalation." We modified two footnotes and added three others.

S. Appendix B, Table B

Illinois EPA updated remediation objectives for all exposure routes using the most current toxicity values and physical and chemical parameter values. We also updated the previously titled "Inhalation" columns to "Outdoor Inhalation." We modified two footnotes and added four others.

T. Appendix B, Table C

Illinois EPA updated the pH specific soil remediation objectives for arsenic and added a footnote extending the pH range from 8.75-9 to 8.75-11.0 for Lead.

U. Appendix B, Table D

Illinois EPA added a footnote extending the pH range from 8.75-9 to 8.75-11.0 for Lead.

V. Appendix B, Table E

Illinois EPA updated remediation objectives for the groundwater ingestion exposure route using the most current toxicity values and physical and chemical parameter values. We also renamed this table and added fifteen chemicals based on the proposed Groundwater Quality Standards (35 Ill. Adm. Code Part 620). We added six new footnotes.

W. Appendix B, Table F

Illinois EPA updated the GW_{obj} concentrations to reflect changes in the toxicity values and to keep pace with the proposed amendments to the Groundwater Quality Standards (35 Ill. Adm. Code Part 620). Fifteen new chemicals and one footnote have been added.

X. Appendix B, Table G

This is a new table containing the Tier 1 remediation objectives for volatile chemicals under the indoor inhalation pathway. Residential and industrial/commercial values are given for soil gas, soil and groundwater.

Y. Appendix C, Table B

A few SSL parameters have been updated. Sources for the toxicity values have been updated to reflect changes in the USEPA's hierarchy of human health toxicity values.

Z. Appendix C, Table D

A few RBCA parameters have been updated. Sources for the toxicity values have been updated to reflect changes in the USEPA's hierarchy of human health toxicity values.

AA. Appendix C, Table E

Illinois EPA updated the default values for all chemicals (not just volatile chemicals) to be consistent with current scientific literature. We also inserted a new column of default values for Dimensionless Henry's Law Constant at 13° C and added three new footnotes. All values are now expressed in scientific notation.

BB. Appendix C, Table F

Illinois EPA added new methods for determining the following physical soil parameters: total soil porosity, air-filled soil porosity, and water-filled soil porosity.

CC. Appendix C, Table I

Illinois EPA added MCPP since it is one of the new chemicals proposed under the Groundwater Quality Standards (35 Ill. Adm. Code Part 620) and deleted 2,4,5-TP (Silvex) because it no longer ionizes over the pH range of 4.5-9.0.

DD. Appendix C, Table L

This is a new table containing the J&E equations used in calculating remediation objectives for the indoor inhalation exposure route.

EE. Appendix C, Table M

This is a new table containing the J&E parameters used in calculating remediation objectives for the indoor inhalation exposure route.

III. AGENCY WITNESSES AND SYNOPSIS OF TESTIMONY

Illinois EPA will provide five witnesses who will be available to testify at hearing. The witnesses are Gary King, Thomas Hornshaw, Tracey Hurley, and Joyce Munie from Illinois EPA and Atul Salhotra from the RAM Group.

Illinois EPA will submit written testimony in advance of the hearings pursuant to any hearing officer order that follows this proposal. Illinois EPA respectfully requests that the Board allow oral testimony of Illinois EPA's witnesses in panel format rather than calling each individually. This has streamlined several regulatory hearings in the past and allows Illinois EPA to more fully respond to questions during the hearing, thereby promoting a more complete hearing record.

As a note to the Board, Illinois EPA does not have a Notice or Service List for purposes of this proposal. Therefore, we are sending this proposal to the individuals required by the Board's procedural rules. Illinois EPA requests that once the Board establishes Notice and Service lists for this rulemaking that it send those to Illinois EPA so that we can properly serve parties with any future submittals.

WHEREFORE, Illinois EPA requests that the Board accept this proposal in its entirety for hearing.

Respectfully submitted,
ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: _____
Kimberly A. Geving
Assistant Counsel
Division of Legal Counsel

DATED: September 2, 2008

1021 North Grand Ave. East
P.O. Box 19276
Springfield, Illinois 62794-9276
(217) 782-5544

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER f: RISK BASED CLEANUP OBJECTIVES

PART 742
TIERED APPROACH TO CORRECTIVE ACTION OBJECTIVES

SUBPART A: INTRODUCTION

SUBPART B: GENERAL

SUBPART C: EXPOSURE ROUTE EVALUATIONS

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

SUBPART D: DETERMINING AREA BACKGROUND

SUBPART E: TIER 1 EVALUATION

SUBPART F: TIER 2 GENERAL EVALUATION

SUBPART G: TIER 2 SOIL EVALUATION

SUBPART H: TIER 2 GROUNDWATER EVALUATION

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

SUBPART I: TIER 3 EVALUATION

SUBPART J: INSTITUTIONAL CONTROLS

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AUTHORITY: Implementing Sections 22.4, 22.12, Title XVI, and Title XVII and authorized by Sections 27 and 58.5 of the Environmental Protection Act [415 ILCS 5/22.4, 22.12, 27, and 58.5 and Title XVI and Title XVII].

SOURCE: Adopted in R97-12(A) at 21 Ill. Reg. 7942, effective July 1, 1997; amended in R97-12(B) at 21 Ill. Reg. 16391, effective December 8, 1997; amended in R97-12(C) at 22 Ill. Reg. 10847, effective June 8, 1998; amended in R00-19(A) at 25 Ill. Reg. 651, effective January 6, 2001; amended in R00-19(B) at 25 Ill. Reg. 10374, effective August 15, 2001; amended in R00-19(C) at 26 Ill. Reg. 2683, effective February 5, 2002; amended in R06-10 at 31 Ill. Reg. 4063, effective February 23, 2007; amended at ___ Ill. Reg. _____, effective _____.

NOTE: Italics indicates statutory language.

SUBPART A: INTRODUCTION

Section 742.110 Overview of Tiered Approach

a) This Part presents an approach for developing remediation objectives (see Appendix A, Illustrations A and B) that include an option for exclusion of pathways from further consideration, use of area background concentrations as remediation objectives and three tiers for selecting applicable remediation

objectives. An understanding of human exposure routes is necessary to properly conduct an evaluation under this approach. In some cases, applicable human exposure route(s) can be excluded from further consideration prior to any tier evaluation. Selecting which tier or combination of tiers to be used to develop remediation objectives is dependent on the site-specific conditions and remediation goals. Tier 1 evaluations and Tier 2 evaluations are not prerequisites to conducting Tier 3 evaluations.

b) A Tier 1 evaluation compares the concentration of contaminants detected at a site to the corresponding remediation objectives for residential and industrial/commercial properties contained in Appendix B, Tables A, B, C, D ~~and~~ E and G. To complete a Tier 1 evaluation, the extent and concentrations of the contaminants of concern, the groundwater class, the land use classification, human exposure routes at the site, and, if appropriate, soil pH, must be known. If remediation objectives are developed based on industrial/commercial property use, then institutional controls under Subpart J are required.

c) A Tier 2 evaluation uses the risk based equations from the Soil Screening Level (SSL Model) and Risk Based Corrective Action (RBCA Model) and modified Johnson and Ettinger Model (J & E Model) documents listed in Appendix C, Tables A, ~~and~~ C, and L respectively. In addition to the information that is required for a Tier 1 evaluation, site-specific information is used to calculate Tier 2 remediation objectives. As in Tier 1, Tier 2 evaluates residential and industrial/commercial properties only. If remediation objectives are developed based on industrial/commercial property use, then institutional controls under Subpart J are required.

d) A Tier 3 evaluation allows alternative parameters and factors, not available under a Tier 1 or Tier 2 evaluation, to be considered when developing remediation objectives. Remediation objectives developed for conservation and agricultural properties can only be developed under Tier 3.

e) Remediation objectives may be developed using area background concentrations or any of the three tiers if the evaluation is conducted in accordance with applicable requirements in Subparts D through I. When contaminant concentrations do not exceed remediation objectives developed under one of the tiers or area background procedures under Subpart D, further evaluation under any of the other tiers is not required.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

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Section 742.115 Key Elements

To develop remediation objectives under this Part, the following key elements shall be addressed.

a) Exposure Routes

1) This Part identifies the following as potential exposure routes to be addressed:

A) Outdoor Inhalation;

B) Indoor Inhalation;

C ~~B~~) Soil ingestion;

D ~~C~~) Groundwater ingestion; and

E ~~D~~) Dermal contact with soil.

2) The evaluation of exposure routes under subsections (a)(1)(A),(a)(1)(B), ~~and~~ (a)(1)(C) and (a)(1)(D) of this Section is required for all sites when developing remediation objectives or excluding exposure pathways. Evaluation of the dermal contact exposure route is required for use of RBCA equations in Appendix C, Table C or use of formal risk assessment under Section 742.915.

3) The groundwater ingestion exposure route is comprised of two components:

A) Migration from soil to groundwater (soil component); and

B) Direct ingestion of groundwater (groundwater component).

4) The indoor inhalation exposure route is comprised of two components:

A) Migration from soil through soil gas to indoor air (soil component); and

B) Migration from groundwater through soil gas to indoor air (groundwater component).

b) Contaminants of Concern

The contaminants of concern to be remediated depend on the following:

1) The materials and wastes managed at the site;

2) The extent of the no further remediation determination being requested from the Agency pursuant to a specific program; and

3) The requirements applicable to the specific program, as listed at Section 742.105(b) under which the remediation is being performed.

c) Land Use

The present and post-remediation uses of the site where exposures may occur shall be evaluated. The land use of a site, or portion thereof, shall be classified as one of the following:

1) Residential property;

2) Conservation property;

3) Agricultural property; or

4) Industrial/commercial property.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

SUBPART B: GENERAL

Section 742.200 Definitions

Except as stated in this Section, or unless a different meaning of a word or term is clear from the context, the definition of words or terms in this Part shall be the same as that applied to the same words or terms in the Act.

"Act" means the Illinois Environmental Protection Act [415 ILCS 5].

"ADL" means Acceptable Detection Limit, which is the detectable concentration of a substance that is equal to the lowest appropriate Practical Quantitation Limit (PQL) as defined in this Section.

"Agency" means the Illinois Environmental Protection Agency.

"Agricultural Property" means any real property for which its present or post-remediation use is for growing agricultural crops for food or feed either as harvested crops, cover crops or as pasture. This definition includes, but is not limited to, properties used for confinement or grazing of livestock or poultry and for silviculture operations. Excluded from this definition are farm residences, farm outbuildings and agrichemical facilities.

"Aquifer" means *saturated (with groundwater) soils and geologic materials which are sufficiently permeable to readily yield economically useful quantities of water to wells, springs, or streams under ordinary hydraulic gradients.* (Illinois Groundwater Protection Act [415 ILCS 55/3(a)])

"Area Background" means *concentrations of regulated substances that are consistently present in the environment in the vicinity of a site that are the result of natural conditions or human activities, and not the result solely of releases at the site.* [415 ILCS 5/58.2]

"ASTM" means the American Society for Testing and Materials.

"Board" means the Illinois Pollution Control Board.

"Building" means a man-made structure with an enclosing roof and enclosing walls, except for windows and doors, that is intended for or supports any human occupancy for more than six consecutive months.

"Building Control Technology" means any technology, barrier or geologic material that affects air flow or air pressure within a building for purposes of reducing contaminant migration to the indoor air.

"Cancer Risk" means a unitless probability of an individual developing cancer from a defined exposure rate and frequency.

"Cap" means a barrier designed to prevent the infiltration of precipitation or other surface water, or impede the ingestion or inhalation of contaminants.

"Carcinogen" means *a contaminant that is classified as a category A1 or A2 carcinogen by the American Conference of Governmental Industrial Hygienists; a category 1 or 2A/2B carcinogen by the World Health Organization's International Agency for Research on Cancer; a "human carcinogen" or "anticipated human carcinogen" by the United States Department of Health and Human Service National Toxicological Program; or a category A or B1/B2 carcinogen by the United States Environmental Protection Agency in the integrated risk information system or a final rule issued in a Federal Register notice by the USEPA.* [415 ILCS 5/58.2]

"Class I Groundwater" means groundwater that meets the Class I: Potable Resource Groundwater criteria set forth in 35 Ill. Adm. Code 620.

"Class II Groundwater" means groundwater that meets the Class II: General Resource Groundwater criteria set forth in 35 Ill. Adm. Code 620.

"Conservation Property" means any real property for which present or post-remediation use is primarily for wildlife habitat.

"Construction Worker" means a person engaged on a temporary basis to perform work involving invasive construction activities including, but not limited to, personnel performing demolition, earth-moving, building, and routine and emergency utility installation or repair activities.

"Contaminant of Concern" or "Regulated Substance of Concern" means *any contaminant that is expected to be present at the site based upon past and current land uses and associated releases that are known to the* person conducting a remediation *based upon reasonable inquiry* [415 ILCS 5/58.2]

"County highway" means county highway as defined in the Illinois Highway Code, [605 ILCS 5].

"District road" means district road as defined in the Illinois Highway Code, [605 ILCS 5].

"Engineered Barrier" means a barrier designed or verified using engineering practices that limits exposure to or controls migration of the contaminants of concern.

"Environmental Land Use Control" means an instrument that meets the requirements of this Part and is placed in the chain of title to real property that

limits or places requirements upon the use of the property for the purpose of protecting human health or the environment, is binding upon the property owner, heirs, successors, assigns, and lessees, and runs in perpetuity or until the Agency approves, in writing, removal of the limitation or requirement from the chain of title.

"Exposure Route" means the transport mechanism by which a contaminant of concern reaches a receptor.

"Federally Owned Property" means real property owned in fee by the United States of America on which institutional controls are sought to be placed in accordance with this Subpart.

"Federal Landholding Entity" means that federal department, agency, or instrumentality with the authority to occupy and control the day-to-day use, operation and management of Federally Owned Property.

"Free Product" means a contaminant that is present as a non-aqueous phase liquid for chemicals whose melting point is less than 30° C (e.g., liquid not dissolved in water).

"GIS" means Geographic Information System.

"GPS" means Global Positioning System.

"Groundwater" means underground water which occurs within the saturated zone and geologic materials where the fluid pressure in the pore space is equal to or greater than atmospheric pressure. [415 ILCS 5/3.64]

"Groundwater Quality Standards" means the standards for groundwater as set forth in 35 Ill. Adm. Code 620.

"Hazard Quotient" means the ratio of a single substance exposure level during a specified time period to a reference dose for that substance derived from a similar exposure period.

"Highway" *means any public way for vehicular travel which has been laid out in pursuance of any law of this State, or of the Territory of Illinois, or which has been established by dedication, or used by the public as a highway for 15 years, or which has been or may be laid out and connect a subdivision or platted land with a public highway and which has been dedicated for the use of the owners of*

the land included in the subdivision or platted land where there has been an acceptance and use under such dedication by such owners, and which has not been vacated in pursuance of law. The term "highway" includes rights of way, bridges, drainage structures, signs, guard rails, protective structures and all other structures and appurtenances necessary or convenient for vehicular traffic. A highway in a rural area may be called a "road", while a highway in a municipal area may be called a "street". (Illinois Highway Code [605 ILCS 5/2-202])

"Highway Authority" means *the Department* of Transportation *with respect to a State highway;* the Illinois State Toll Highway with respect to a toll highway; *the County Board with respect to a county highway or a county unit district road if a discretionary function is involved and the County Superintendent of Highways if a ministerial function is involved; the Highway Commissioner with respect to a township or district road not in a county unit road district; or the corporate authorities of a municipality with respect to a municipal street.* (Illinois Highway Code [605 ILCS 5/2-213])

"Human Exposure Pathway" means a physical condition which may allow for a risk to human health based on the presence of all of the following: contaminants of concern; an exposure route; and a receptor activity at the point of exposure that could result in contaminant of concern intake.

"Industrial/Commercial Property" means any real property that does not meet the definition of residential property, conservation property or agricultural property. "Infiltration" means the amount of water entering into the ground as a result of precipitation.

"Institutional Control" means a legal mechanism for imposing a restriction on land use, as described in Subpart J.

"Land Use Control Memoranda of Agreement" mean agreements entered into between one or more agencies of the United States and the Illinois Environmental Protection Agency that limit or place requirements upon the use of Federally Owned Property for the purpose of protecting human health or the environment.

"Man-Made Pathways" means *constructed* physical conditions *that may allow for the transport of regulated substances including, but not limited to, sewers, utility lines, utility* or elevator *vaults, building foundations, basements, crawl spaces, drainage ditches, ~~or~~ previously excavated and filled areas,* or sumps. [415 ILCS 5/58.2]

"Natural Pathways" means *natural* physical conditions that may allow *for the transport of regulated substances including, but not limited to, soil, groundwater, sand seams and lenses, and gravel seams and lenses.* [415 ILCS 5/58.2]

"Person" means an *individual, trust, firm, joint stock company, joint venture, consortium, commercial entity, corporation (including a government corporation), partnership, association, state, municipality, commission, political subdivision of a state, or any interstate body including the United States government and each department, agency, and instrumentality of the United States.* [415 ILCS 5/58.2]

"Point of Human Exposure" means the points at which human exposure to a contaminant of concern may reasonably be expected to occur. The point of human exposure is at the source, unless an institutional control limiting human exposure for the applicable exposure route has been or will be in place, in which case the point of human exposure will be the boundary of the institutional control. Point of human exposure may be at a different location than the point of compliance.

"Populated Area" means

an area within the boundaries of a municipality that has a population of 10,000 or greater based on the year 2000 or most recent census; or

an area less than three miles from the boundary of a municipality that has a population of 10,000 or greater based on the year 2000 or most recent census.

"Potable" means *generally fit for human consumption in accordance with accepted water supply principles and practices.* (Illinois Groundwater Protection Act [415 ILCS 55/3(h)])

"PQL" means practical quantitation limit or estimated quantitation limit, which is the lowest concentration that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method during routine laboratory operating conditions in accordance with "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", EPA Publication No. SW-846, incorporated by reference in Section 742.210. When applied to filtered water samples, PQL includes the method detection limit or estimated detection limit in accordance with the applicable method revision in: "Methods for the Determination of Organic Compounds in Drinking Water", Supplement II", EPA

Publication No. EPA/600/4-88/039; "Methods for the Determination of Organic Compounds in Drinking Water, Supplement III", EPA Publication No. EPA/600/R-95/131, all of which are incorporated by reference in Section 742.210.

"RBCA" means Risk Based Corrective Action as defined in ASTM E-1739-95, as incorporated by reference in Section 742.210.

"RCRA" means the Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6921).

"Reference Concentration" or "RfC" means an estimate of a daily exposure, in units of milligrams of chemical per cubic meter of air (mg/m(3)), to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious effects during a portion of a lifetime (up to approximately seven years, subchronic) or for a lifetime (chronic).

"Reference Dose" or "RfD" means an estimate of a daily exposure, in units of milligrams of chemical per kilogram of body weight per day (mg/kg/d), to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious effects during a portion of a lifetime (up to approximately seven years, subchronic) or for a lifetime (chronic).

"Regulated Substance" means *any hazardous substance as defined under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (P.L. 96-510) and petroleum products including crude oil or any fraction thereof, natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).* [415 ILCS 5/58.2]

"Residential Property" *means any real property that is used for habitation by individuals, or* where children have the opportunity for exposure to contaminants through soil ingestion or inhalation at educational facilities, health care facilities, child care facilities or outdoor recreational areas. [415 ILCS 5/58.2]

"Right of Way" means *the land, or interest therein, acquired for or devoted to a highway.* (Illinois Highway Code [605 ILCS 5/2-217])

"Similar-Acting Chemicals" are chemical substances that have toxic or harmful effect on the same specific organ or organ system (see Appendix A.Tables E and

F for a list of similar-acting chemicals with noncarcinogenic and carcinogenic effects).

"Site" means *any single location, place, tract of land or parcel of property, or portion thereof, including contiguous property separated by a public right-of-way.* 415 ILCS 5/58.2]

"Slurry Wall" means a man-made barrier made of geologic material which is constructed to prevent or impede the movement of contamination into a certain area.

"Soil Gas" means the air existing in void spaces in the soil between the groundwater table and the ground surface.

"Soil Saturation Limit" or "C_{sat}" means ~~the contaminant concentration at which soil pore air and pore water are saturated with the chemical and the adsorptive limits of the soil particles have been reached~~. the contaminant concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) do not apply, and alternative modeling approaches are required.

"Soil Vapor Saturation Limit" or "C_v^{sat}" means the maximum vapor concentration that can exist in the soil pore air at a given temperature and pressure.

"Solubility" means a chemical specific maximum amount of solute that can dissolve in a specific amount of solvent (groundwater) at a specific temperature.

"SPLP" means Synthetic Precipitation Leaching Procedure (Method 1312) as published in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", USEPA Publication No. SW-846, as incorporated by reference in Section 742.210.

"SSL" means Soil Screening Levels as defined in USEPA's Soil Screening Guidance: User's Guide and Technical Background Document, as incorporated by reference in Section 742.210.

"State highway" means state highway as defined in the Illinois Highway Code [605 ILCS 5].

"Stratigraphic Unit" means a site-specific geologic unit of native deposited material and/or bedrock of varying thickness (e.g., sand, gravel, silt, clay, bedrock, etc.). A change in stratigraphic unit is recognized by a clearly distinct contrast in geologic material or a change in physical features within a zone of gradation. For the purposes of this Part, a change in stratigraphic unit is identified by one or a combination of differences in physical features such as texture, cementation, fabric, composition, density, and/or permeability of the native material and/or bedrock.

"Street" means street as defined in the Illinois Highway Code [605 ILCS 5].

"TCLP" means Toxicity Characteristic Leaching Procedure (Method 1311) as published in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", USEPA Publication No. SW-846, as incorporated by reference in Section 742.210.

"Toll highway" means toll highway as defined in the Illinois Highway Code [605 ILCS 5].

"Total Petroleum Hydrocarbon (TPH)" means the additive total of all petroleum hydrocarbons found in an analytical sample.

"Township road" means township road as defined in the Illinois Highway Code [605 ILCS 5].

"Volatile Chemicals" means chemicals with a Dimensionless Henry's Law Constant of greater than 1.9×10^{-2} or a vapor pressure greater than 0.1 Torr (mmHg) at 25°C. For purposes of the indoor inhalation exposure route, elemental mercury is included in this definition.

~~"Volatile Organic Compounds (VOCs)" means organic chemical analytes identified as volatiles as published in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", USEPA Publication No. SW-846 (incorporated by reference in Section 742.210), method numbers 8011, 8015B, 8021B, 8031, 8260B, 8315A, and 8316. For analytes not listed in any category in those methods, those analytes which have a boiling point less than 200° C and a vapor pressure greater than 0.1 Torr (mm Hg) at 20° C.~~

(Source: Amended at ___ Ill. Reg. _____, effective _____)

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Section 742.210 Incorporations by Reference

a) The Board incorporates the following material by reference:

Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs), U.S. Environmental Protection Agency, 1600 Clifton Road, Mailstop F32, Atlanta, Georgia 30333, (770) 488-3357 (December 2006).

ASTM. ~~American Society for Testing and Materials~~ International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. (610) 832-9585.

ASTM D 2974-00, Standard Test Methods for Moisture, Ash and Organic Matter of Peat and Other Organic Soils, approved August 10, 2000.

ASTM D 2488-00, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), approved February 10, 2000.

ASTM D 1556-00, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method, approved March 10, 2000.

ASTM D 2167-94, Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method, approved March 15, 1994.

ASTM D 2922-01, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth), approved June 10, 2001.

ASTM D 2937-00e1, Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method, approved June 10, 2000.

ASTM D 854-02, Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer, approved July 10, 2002.

ASTM D 2216-98, Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass, approved February 10, 1998.

ASTM D 4959-00, Standard Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating, approved March 10, 2000.

ASTM D 4643-00, Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method, approved February 10, 2000.

ASTM D 5084-03, Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, approved November 1, 2003.

ASTM D 422-63 (2002), Standard Test Method for Particle-Size Analysis of Soils, approved November 10, 2002.

ASTM D 1140-00, Standard Test Methods for Amount of Material in Soils Finer than the No. 200 (75 μm) Sieve, approved June 10, 2000.

ASTM D 3017-01, Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth), approved June 10, 2001.

ASTM D 4525-90 (2001), Standard Test Method for Permeability of Rocks by Flowing Air, approved May 25, 1990.

ASTM D 2487-00, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System), approved March 10, 2000.

ASTM D 1945-03, Standard Test Method for Analysis of Natural Gas by Gas Chromatography, approved May 10, 2003

ASTM D 1946-90, Standard Practice for Analysis of Reformed Gas by Gas Chromatography, approved June 1, 2006

ASTM E 1527-00, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, approved May 10, 2000. Vol. 11.04.

ASTM E 1739-95 (2002), Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, approved September 10, 1995.

ASTM E 2121-03, Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings, approved February 10, 2003.

ASTM E 2600-08, Standard Practice for Assessment for Vapor Intrusion into Structures on Property Involved in Real Estate Transactions, approved March 7, 2008.

Barnes, Donald G. and Dourson, Michael. (1988). Reference Dose (RfD): Description and Use in Health Risk Assessments. Regulatory Toxicology and Pharmacology. 8, 471-486.

EPRI. Electric Power Research Institute. 3420 Hillview Avenue, Palo Alto, California 94304. (650) 855-2121.

Polycyclic Aromatic Hydrocarbons (PAHs) in Surface Soil in Illinois: Background PAHs, EPRI, Palo Alto, CA, We Energies, Milwaukee, WI, and IEPA, Springfield, IL: 2004. 1011376.

"Reference Handbook for Site-Specific Assessment of Subsurface Vapor Intrusion to Indoor Air," Electric Power Research Institute (EPRI), Inc., Program No. 1008492, (March 2005).

GPO. Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20401, (202) 783-3238.

USEPA Guidelines for Carcinogenic Risk Assessment, 51 Fed. Reg. 33992-34003 (September 24, 1986).

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", USEPA Publication number SW-846 (Third Edition, Final Update IIIA, April 1998), as amended by Updates I, IIA, III, and IIIA (Document No. 955-001-00000-1).

"Methods for the Determination of Organic Compounds in Drinking Water", EPA Publication No. EPA/600/4-88/039 (December 1988 (Revised July 1991)).

"Methods for the Determination of Organic Compounds in Drinking Water, Supplement I", EPA Publication No. EPA/600/4-90/020 (July 1990).

"Methods for the Determination of Organic Compounds in Drinking Water, Supplement II", EPA Publication No. EPA/600/R-92/129 (August 1992).

"Methods for the Determination of Organic Compounds in Drinking Water, Supplement III", EPA Publication No. EPA/600/R-95/131 (August 1995).

"Guidance for Data Quality Assessment, Practical Methods for Data Analysis, EPA QA/G-9, QAOO Update," EPA/600/R-96/084 (July 2000). Available at www.epa.gov/quality/qs-docs/g9-final.pdf.

"Assessment of Vapor Intrusion in Homes Near the Raymark Superfund Site Using Basement and Sub-Slab Air Samples", EPA Publication No. EPA/600/R-05/147 (March 2006).

"Model Standards and Techniques for Control of Radon in New Residential Buildings" EPA Publication No. EPA/402/R-94/009 (March 1994).

IRIS. Integrated Risk Information System, National Center for Environmental Assessment, U.S. Environmental Protection Agency, 26 West Martin Luther King Drive, MS-190, Cincinnati, OH 45268, (513) 569-7254.

"Reference Dose (RfD): Description and Use in Health Risk Assessments", Background Document 1A (March 15, 1993).

"EPA Approach for Assessing the Risks Associated with Chronic Exposures to Carcinogens", Background Document 2 (January 17, 1992).

Johnson, Paul C. (2005). Identification of Application Specific Critical Inputs for the 1991 Johnson and Ettinger Vapor Intrusion Algorithm. Ground Water Monitoring and Remediation. 25(1), 63-78.

Murray, Donald M. and Burmaster, David E. (1995). Residential Air Exchange Rates in the United States: Empirical and Estimated Parametric Distributions by Season and Climatic Region. Risk Analysis. 15(4), 459-465.

Nelson, D.W., and L.E. Sommers (1982). Total carbon, organic carbon, and organic matter. In: A.L. Page (ed.), Methods of Soil Analysis. Part 2. Chemical and Microbiological Properties. 2nd Edition, pp. 539-579, American Society of Agronomy. Madison, WI.

NTIS. National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4600.

"Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites," USEPA Office of Emergency and Remedial Response, OSWER 9285.6-10 (December 2002), PB 2003-104982.

"Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils," OSWER Draft Guidance. EPA Publication No. EPA/530D-02/004 (November 2002).

"Exposures Factors Handbook, Vol. I: General Factors", EPA Publication No. EPA/600/P-95/002Fa (August 1997).

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c) This Section incorporates no later editions or amendments.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.220 Determination of Soil Saturation Limit

a) For any organic contaminant that has a melting point below 30°C, the remediation objective for the outdoor and indoor inhalation exposure route developed under Tier 2 shall not exceed the soil saturation limit, as determined under subsection (c) of this Section.

b) For any organic contaminant that has a melting point below 30°C, the remediation objective under Tier 2 for the soil component of the groundwater ingestion exposure route shall not exceed the soil saturation limit, as determined under subsection (c) of this Section.

c) The soil saturation limit shall be:

1) The value listed in Appendix A, Table A for that specific contaminant~~;~~. For the indoor inhalation exposure route, the value listed in Appendix A, Table L shall be used;

2) A value derived from Equation S29 in Appendix C, Table A~~; or~~. For the indoor inhalation exposure route, the value derived from Equation J&E6a in Appendix C, Table L shall be used; or

3) A value derived from another method approved by the Agency.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.222 Determination of Soil Vapor Saturation Limit

a) For any volatile chemical, the soil gas remediation objective for the indoor inhalation exposure route developed under Tier 2 shall not exceed the soil vapor saturation limit, as determined under subsection (b) of this Section.

b) The soil vapor saturation limit shall be:

1) The value listed in Appendix A, Table K for that specific contaminant;

2) A value derived from Equation J&E6b in Appendix C, Table L; or

3) A value derived from another method approved by the Agency.

(Source: Added at ___ Ill. Reg. _____, effective _____)

Section 742.225 Demonstration of Compliance with Remediation Objectives

Compliance is achieved if each sample result does not exceed that respective remediation objective unless a person elects to proceed under subsections (c), (d) and (e) of this Section.

a) Compliance with groundwater remediation objectives developed under Subparts D through F and H through I shall be demonstrated by comparing the contaminant concentrations of discrete samples at each sample point to the applicable groundwater remediation objective. Sample points shall be determined by the program under which remediation is performed.

b) Unless the person elects to composite samples or average sampling results as provided in subsections (c) and (d) of this Section, compliance with soil

remediation objectives developed under Subparts D through G and I shall be demonstrated by comparing the contaminant concentrations of discrete samples to the applicable soil remediation objective.

1) Except as provided in subsections (c) and (d) of this Section, compositing of samples is not allowed.

2) Except as provided in subsections (c) and (d) of this Section, averaging of sample results is not allowed.

3) Notwithstanding subsections (c) and (d) of this Section, compositing of samples and averaging of sample results is not allowed for the construction worker population.

4) The number of sampling points required to demonstrate compliance is determined by the requirements applicable to the program under which remediation is performed.

5) Except as determined through a plan approved by the Agency in Tier 3, compositing and averaging of sample results are not allowed for the indoor inhalation exposure route.

c) If a person chooses to composite soil samples or average soil sample results to demonstrate compliance relative to the soil component of the groundwater ingestion exposure route, the following requirements apply:

1) A minimum of two sampling locations for every 0.5 acre of contaminated area is required, with discrete samples at each sample location obtained at every two feet of depth, beginning at six inches below the ground surface for surface contamination and at the upper limit of contamination for subsurface contamination and continuing through the zone of contamination. Alternatively, a sampling method may be approved by the Agency based on an appropriately designed site-specific evaluation. Samples obtained at or below the water table shall not be used in compositing or averaging.

2) For contaminants of concern other than volatile ~~organic contaminants~~ chemicals:

A) Discrete samples from the same boring may be composited; or

B) Discrete sample results from the same boring may be averaged.

3) For volatile ~~organic contaminants~~ chemicals:

A) Compositing of samples is not allowed.

B) Discrete sample results from the same boring may be averaged.

4) Composite samples may not be averaged. An arithmetic average may be calculated for discrete samples collected at every two feet of depth through the zone of contamination as specified above in Section 742.225(c)(1) of this Section.

d) If a person chooses to composite soil samples or average soil sample results to demonstrate compliance relative to the outdoor inhalation exposure route or ingestion exposure routes, the following requirements apply:

1) A person shall submit a sampling plan for Agency approval, based upon a site-specific evaluation;

2) For volatile ~~organic compounds~~ chemicals, compositing of samples is not allowed; and

3) All samples shall be collected within the contaminated area.

4) Composite samples may not be averaged. Procedures specified in "Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites", USEPA Office of Emergency and Remedial Response, OSWER 9285.6-10 (December 2002), as incorporated by reference in Section 742.210, or an alternative procedure approved by the Agency, shall be used to determine sample averages.

e) When averaging under this Section, if no more than 15% of sample results are reported as "non-detect", "no contamination", "below detection limits", or similar terms, such results shall be included in the averaging calculations as one-half the reported analytical detection limit for the contaminant. However, when performing a test for normal or lognormal distribution for the purpose of calculating a 95% Upper Confidence Limit of the mean for a contaminant, a person may substitute for each non-detect value a randomly generated value between, but not including, zero and the reported analytical detection limit. If more than 15% of sample results are "non-detect", procedures specified in

"Guidance for Data Quality Assessment, Practical Methods for Data Analysis, EPA QA/G-9, QA00 Update", EPA/600/R-96/084 (July 2000), as incorporated by reference in Section 742.210, or an alternative procedure approved by the Agency shall be used to address the non-detect values, or another statistically valid procedure approved by the Agency may be used to determine an average.

f) All soil samples collected after August 15, 2001, shall be reported on a dry weight basis for the purpose of demonstrating compliance, with the exception of the TCLP and SPLP and the property pH.

(Source: Amended at _____ Reg. _____, effective _____)

Section 742.227 Demonstration of Compliance with Soil Gas Remediation Objectives for the Indoor Inhalation Exposure Route

Compliance shall be demonstrated by comparing the contaminant concentrations of discrete samples at each sample point to the applicable soil gas remediation objective contained in Appendix B, Table G.

a) Sample points shall be determined by the program under which remediation is performed.

b) When collecting soil gas samples:

1) Use rigid-wall tubing made of nylon or Teflon® or other material approved by the Agency;

2) Use gas-tight, inert containers to hold the sample. For light sensitive or halogenated volatile chemicals, these containers shall be opaque or dark-colored;

3) Purge three volumes before obtaining each discrete soil gas sample;

4) Use a tracer of isopropyl alcohol or other leak compound approved by the Agency; and

5) Limit the flow rate to 200 ml/min.

c) Soil gas samples shall be analyzed using a National Environmental Laboratory Accreditation Program (NELAP) certified laboratory.

d) Soil gas remediation objectives shall be compared to concentrations of soil gas collected at a depth at least 3 feet below ground surface and above the saturated zone.

(Source: Added at _____ Reg. _____, effective _____)

SUBPART C: EXPOSURE ROUTE EVALUATIONS

Section 742.310 Outdoor Inhalation Exposure Route

The outdoor inhalation exposure route may be excluded from consideration if:

a) The requirements of Sections 742.300 and 742.305 are met;

b) An approved engineered barrier is in place that meets the requirements of Subpart K;

c) Safety precautions for the construction worker are taken if the Tier 1 construction worker remediation objectives are exceeded; and

d) An institutional control, in accordance with Subpart J, will be placed on the property.

(Source: Amended at _____ Reg. _____, effective _____)

Section 742.312 Indoor Inhalation Exposure Route

The indoor inhalation exposure route may be excluded from consideration if:

a) None of the contaminants of concern are listed on Appendix A, Table J and none of the contaminants of concern are volatile chemicals, as defined in Section 742.200; or

b) The following requirements in subsections (b)(1)(A) or (B), and (b)(2) and (b)(3) are met:

1) A) No building or man-made pathway exists or will be placed above the contaminated soil or groundwater; or

B) An approved building control technology is in place that meets the requirements of Subpart L; and

2) The requirements of Sections 742.300 and 742.305 are met; and

3) An institutional control, in accordance with Subpart J, will be placed on the property.

(Source: Added at _____ Reg. _____, effective _____)

SUBPART D: DETERMINING AREA BACKGROUND

Section 742.405 Determination of Area Background for Soil

a) Soil sampling results shall be obtained for purposes of determining area background levels in accordance with the following procedures:

1) For volatile ~~organic contaminants~~ chemicals, sample results shall be based on discrete samples;

2) Unless an alternative method is approved by the Agency, for contaminants other than volatile ~~organic contaminants~~ chemicals, sample results shall be based on discrete samples or composite samples. If a person elects to use composite samples, each 0.5 acre of the area to be sampled shall be divided into quadrants and 5 aliquots of equal volume per quadrant shall be composited into 1 sample;

3) Samples shall be collected from similar depths and soil types, which shall be consistent with the depths and soil types in which maximum levels of contaminants are found in the areas of known or suspected releases; and

4) Samples shall be collected from areas of the site or adjacent to the site that are unaffected by known or suspected releases at or from the site. If the sample results show an impact from releases at or from the site, then the sample results shall not be included in determining area background levels under this Part.

b) Area background shall be determined according to one of the following approaches:

1) Statewide Area Background Approach:

A) The concentrations of inorganic chemicals in background soils listed in Appendix A, Table G may be used as the upper limit of the area background concentration for the site. The first column to the right of the chemical name presents inorganic chemicals in background soils for counties within Metropolitan Statistical Areas. Counties within Metropolitan Statistical Areas are identified in Appendix A, Table G, Footnote a. Sites located in counties outside Metropolitan Statistical Areas shall use the concentrations of inorganic chemicals in background soils shown in the second column to the right of the chemical name.

B) Soil area background concentrations determined according to this statewide area background approach shall be used as provided in Section 742.415(b) of this Part. For each parameter whose sampling results demonstrate concentrations above those in Appendix A, Table G, the person shall develop appropriate soil remediation objectives in accordance with this Part, or may determine area background in accordance with subsection (b)(2) of this Section.

2) A statistically valid approach for determining area background concentrations appropriate for the characteristics of the data set, and approved by the Agency.

(Source: Amended at _____ Reg. _____, effective _____)

SUBPART E: TIER 1 EVALUATION

Section 742.500 Tier 1 Evaluation Overview

a) A Tier 1 evaluation compares the concentration of each contaminant of concern detected at a site to the baseline remediation objectives provided in Appendix B, Tables A, B, C, D, ~~and~~ E and G. Use of Tier 1 remediation objectives requires only limited site-specific information: concentrations of contaminants of concern, groundwater classification, land use classification, and, if appropriate, soil pH. (See Appendix B, Illustration A.)

b) Although Tier 1 allows for differentiation between residential and industrial/commercial property use of a site, an institutional control under Subpart J is required where remediation objectives are based on an industrial/commercial property use.

c) Any given exposure route is not a concern if the concentration of each contaminant of concern detected at the site is below the Tier 1 value of that given route. In such a case, no further evaluation of that route is necessary.

(Source: Amended at _____ Reg. _____, effective _____)

Section 742.505 Tier 1 Soil and Groundwater Remediation Objectives

a) Soil

1) Outdoor Inhalation Exposure Route

A) The Tier 1 soil remediation objectives for this exposure route based upon residential property use are listed in Appendix B, Table A.

B) The Tier 1 soil remediation objectives for this exposure route based upon industrial/commercial property use are listed in Appendix B, Table B. Soil remediation objective determinations relying on this table require use of institutional controls in accordance with Subpart J.

2) Ingestion Exposure Route

A) The Tier 1 soil remediation objectives for this exposure route based upon residential property use are listed in Appendix B, Table A.

B) The Tier 1 soil remediation objectives for this exposure route based upon industrial/commercial property use are listed in Appendix B, Table B. Soil remediation objective determinations relying on this table require use of institutional controls in accordance with Subpart J.

3) Soil Component of the Groundwater Ingestion Route

A) The Tier 1 soil remediation objectives for this exposure route based upon residential property use are listed in Appendix B, Table A.

B) The Tier 1 soil remediation objectives for this exposure route based upon industrial/commercial property use are listed in Appendix B, Table B.

C) The pH-dependent Tier 1 soil remediation objectives for identified ionizable organics or inorganics for the soil component of the groundwater ingestion exposure route (based on the total amount of contaminants present in the soil sample results and groundwater classification) are provided in Appendix B, Tables C and D.

D) Values used to calculate the Tier 1 soil remediation objectives for this exposure route are listed in Appendix B, Table F.

4) Evaluation of the dermal contact with soil exposure route is not required under Tier 1.

5) For the soil component of the indoor inhalation exposure route, the requirements of Section 742.515 shall be followed.

b) Groundwater

1) The Tier 1 groundwater remediation objectives for the groundwater component of the groundwater ingestion route are listed in Appendix B, Table E.

2) The Tier 1 groundwater remediation objectives for this exposure route are given for Class I and Class II groundwaters, respectively.

3) The evaluation of 35 Ill. Adm. Code 620.615 regarding mixtures of similar-acting chemicals shall be considered satisfied for Class I groundwater at the point of human exposure if:

A) No more than one similar-acting noncarcinogenic chemical as listed in Appendix A, Table E is detected in the groundwater at the site; and

B) No carcinogenic contaminant of concern as listed in Appendix A, Table I is detected in any groundwater sample associated with the site, using analytical procedures capable of achieving either the 1 in 1,000,000 cancer risk concentration or the ADL, whichever is greater.

4) If the conditions of subsection (b)(3) of this Section are not met, the Class I groundwater remediation objectives set forth in Appendix B, Table E shall be corrected for the cumulative effect of mixtures of similar-acting chemicals using the following methodologies:

A) For noncarcinogenic chemicals, the methodologies set forth at Section 742.805(c) or Section 742.915(h) shall be used; and

B) For carcinogenic chemicals, the methodologies set forth at Section 742.805(d) or Section 742.915(h) shall be used.

5) For the groundwater component of the indoor inhalation exposure route, the requirements of Section 742.515 shall be followed.

(Source: Amended at _____ Reg. _____, effective _____)

Section 742.510 Tier 1 Remediation Objectives Tables

a) Soil remediation objectives are listed in Appendix B, Tables A, B, C and D, except for the indoor inhalation exposure route, in which the requirements of Section 742.515 and Appendix B, Table G shall be followed.

1) Appendix B, Table A is based upon residential property use.

A) The first column to the right of the chemical name lists soil remediation objectives for the soil ingestion exposure route.

B) The second column lists the soil remediation objectives for the outdoor inhalation exposure route.

C) The third and fourth columns list soil remediation objectives for the soil component of the groundwater ingestion exposure route for the respective classes of groundwater:

i) Class I groundwater; and

ii) Class II groundwater.

D) The final column lists the Acceptable Detection Limit (ADL), only where applicable.

2) Appendix B, Table B is based upon industrial/commercial property use.

A) The first and third columns to the right of the chemical name list the soil remediation objectives for the soil ingestion exposure route based on two receptor populations:

i) Industrial/commercial; and

ii) Construction worker.

B) The second and fourth columns to the right of the chemical name list the soil remediation objectives for the outdoor inhalation exposure route based on two receptor populations:

i) Industrial/commercial; and

ii) Construction worker.

C) The fifth and sixth columns to the right of the chemical name list the soil remediation objectives for the soil component of the groundwater ingestion exposure route for two classes of groundwater:

i) Class I groundwater; and

ii) Class II groundwater.

D) The final column lists the acceptable detection limit (ADL), only where applicable.

3) Appendix B, Tables C and D set forth pH specific soil remediation objectives for inorganic and ionizing organic chemicals for the soil component of the groundwater ingestion route.

A) Table C sets forth remediation objectives based on Class I groundwater and Table D sets forth remediation objectives based on Class II groundwater.

B) The first column in Tables C and D lists the chemical names.

C) The second through ninth columns to the right of the chemical names list the pH based soil remediation objectives.

4) For the inorganic chemicals listed in Appendix B, Tables A and B, the soil component of the groundwater ingestion exposure route shall be evaluated using TCLP (SW-846 Method 1311) or SPLP (SW-846 Method 1312), incorporated by reference at Section 742.210 unless a person chooses to evaluate the soil component on the basis of the total amount of contaminant in a soil sample result in accordance with subsection (a)(5) of this Section.

5) For those inorganic and ionizing organic chemicals listed in Appendix B, Tables C and D, if a person elects to evaluate the soil component of the groundwater ingestion exposure route based on the total amount of contaminant in a soil sample result (rather than TCLP or SPLP analysis), the person shall determine the soil pH at the site and then select the appropriate soil remediation objectives based on Class I and Class II groundwaters from Tables C and D, respectively. If the soil pH is less than 4.5 or greater than 9.0, then Tables C and D cannot be used.

6) Unless one or more exposure routes are excluded from consideration under Subpart C, the most stringent soil remediation objective of the exposure routes (i.e., soil ingestion exposure route, outdoor and indoor inhalation exposure routes, and soil component of the groundwater ingestion exposure route) shall be compared to the concentrations of soil contaminants of concern measured at the site. When using Appendix B, Table B to select soil remediation objectives for the ingestion exposure route and outdoor inhalation exposure routes, the remediation objective shall be the more stringent soil remediation objective of the industrial/commercial populations and construction worker populations.

7) Confirmation sample results may be averaged or soil samples may be composited in accordance with Section 742.225.

8) If a soil remediation objective for a chemical is less than the ADL, the ADL shall serve as the soil remediation objective.

b) Groundwater remediation objectives for the groundwater component of the groundwater ingestion exposure route are listed in Appendix B, Table E. However, Appendix B, Table E must be corrected for cumulative effect of

mixtures of similar-acting noncarcinogenic chemicals as set forth in Section 742.505(b)(3).

1) The first column to the right of the chemical name lists groundwater remediation objectives for Class I groundwater, and the second column lists the groundwater remediation objectives for Class II groundwater.

2) To use Appendix B, Table E of this Part, the 35 Ill. Adm. Code 620 classification for groundwater at the site shall be determined. The concentrations of groundwater contaminants of concern at the site are compared to the applicable Tier 1 groundwater remediation objectives for the groundwater component of the groundwater ingestion exposure route in Appendix B, Table E.

c) For contaminants of concern not listed in Appendix B, Tables A, B and E, a person may request site-specific remediation objectives from the Agency or propose site-specific remediation objectives in accordance with 35 Ill. Adm. Code 620, Subpart I of this Part, or both.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.515 Tier 1 Remediation Objectives Table for the Indoor Inhalation Exposure Route

a) Soil remediation objectives for the indoor inhalation exposure route are listed in Appendix B, Table G.

1) The first column to the right of the chemical name lists the soil remediation objectives for residential receptors.

2) The second column lists the soil remediation objectives for industrial/commercial receptors.

3) The third column lists the Acceptable Detection Limit (ADL), only where applicable. If the soil remediation objective for a volatile chemical is less than the ADL, the ADL shall serve as the soil remediation objective.

b) Groundwater remediation objectives for the indoor inhalation exposure route are listed in Appendix B, Table G.

1) The fourth column to the right of the chemical name lists the groundwater remediation objective for residential receptors.

2) The fifth column to the right of the chemical name lists the groundwater remediation objective for industrial/commercial receptors.

c) Soil gas remediation objectives for the indoor inhalation exposure route are listed in Appendix B, Table G.

1) The sixth column to the right of the chemical names lists the soil gas remediation objectives for residential receptors.

2) The seventh column to the right of the chemical name lists the soil gas remediation objectives for industrial/commercial receptors.

d) Unless the indoor inhalation exposure route is excluded from consideration under Subpart C, Tier 1 remediation objectives for the indoor inhalation exposure route shall be used for: 1) soil and groundwater, or 2) soil gas.

e) If using soil and groundwater remediation objectives to demonstrate compliance, then in accordance with Section 742.510(a)(6), the most stringent soil remediation objective and the most stringent groundwater remediation objective of the exposure routes from Appendix B, Tables A, B, E, and G shall be applied to the site, unless one or more exposure routes are excluded under Subpart C. Where a route(s) is excluded, use the most stringent remediation objective of the routes remaining.

f) For volatile chemicals not listed in Appendix B, Table G, a person may request site-specific remediation objectives from the Agency or propose site-specific remediation objectives in accordance with Subpart I of this Part, or both.

(Source: Added at ___ Ill. Reg. _____, effective _____)

SUBPART F: TIER 2 GENERAL EVALUATION

Section 742.600 Tier 2 Evaluation Overview

a) Tier 2 remediation objectives are developed through the use of equations which allow site-specific data to be used. (See Appendix C, Illustrations A and B.) The

equations, identified in Appendix C, Tables A, ~~and~~ C, and L may be used to develop Tier 2 remediation objectives.

b) Tier 2 evaluation is only required for contaminants of concern and corresponding exposure routes (except where excluded from further consideration under Subpart C) exceeding the Tier 1 remediation objectives. When conducting Tier 2 evaluations, the values used in the calculations must have the appropriate units of measure as identified in Appendix C, Tables B, ~~and~~ D, and M.

c) Any development of remediation objectives using site-specific information or equations outside the Tier 2 framework shall be evaluated under Tier 3.

d) Any development of a remediation objective under Tier 2 shall not use a target hazard quotient greater than one at the point of human exposure or a target cancer risk greater than 1 in 1,000,000 at the point of human exposure.

e) In conducting a Tier 2 evaluation, the following conditions shall be met:

1) For each discrete sample, the total soil contaminant concentration of either a single contaminant or multiple contaminants of concern shall not exceed the attenuation capacity of the soil as provided in Section 742.215.

2) Remediation objectives for noncarcinogenic compounds which affect the same target organ, organ system or similar mode of action shall meet the requirements of Section 742.720.

3) The soil remediation objectives based on the outdoor and indoor inhalation exposure routes and the soil component of the groundwater ingestion exposure routes shall not exceed the soil saturation limit as provided in Section 742.220.

4) The soil gas remediation objectives based on the indoor inhalation exposure route shall not exceed the soil vapor saturation limit as provided in Section 742.222.

f) Tier 2 remediation objectives for the indoor inhalation exposure route shall be calculated, as appropriate, for 1) soil and groundwater, or 2) soil gas.

~~f)~~ g) If the calculated Tier 2 soil remediation objective for an applicable exposure route is more stringent than the corresponding Tier 1 remediation objective, then the Tier 1 remediation objective applies.

~~g)~~ h) If the calculated Tier 2 soil remediation objective for an exposure route is more stringent than the Tier 1 soil remediation objective(s) for the other exposure routes, then the Tier 2 calculated soil remediation objective applies and Tier 2 soil remediation objectives for the other exposure routes are not required.

~~h)~~ i) If the calculated Tier 2 soil remediation objective is less stringent than one or more of the soil remediation objectives for the remaining exposure routes, then the Tier 2 values are calculated for the remaining exposure route(s) and the most stringent Tier 2 calculated value applies.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.605 Land Use

a) Present and post-remediation land use is evaluated in a Tier 2 evaluation. Acceptable exposure factors for the Tier 2 evaluation for residential, industrial/commercial, and construction worker populations are provided in the far right column of Appendix C, Tables B, ~~and~~ D, and M. Use of exposure factors different from those in Appendix C, Tables B, ~~and~~ D, and M must be approved by the Agency as part of a Tier 3 evaluation.

b) If a Tier 2 evaluation is based on an industrial/commercial property use, then:

1) Construction worker populations shall also be evaluated; and

2) Institutional controls are required in accordance with Subpart J.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.610 Chemical and Site Properties

a) Physical and Chemical Properties of Contaminants

Tier 2 evaluations require information on the physical and chemical properties of the contaminants of concern. The physical and chemical properties used in a Tier 2 evaluation are contained in Appendix C, Table E. If the site has contaminants not included in this table, a person may request the Agency to provide the applicable physical and chemical input values or may propose input values under Subpart I. If a person proposes to apply values other than those in Appendix C,

Table E, or those provided by the Agency, the evaluation shall be considered under Tier 3.

b) Soil and Groundwater Parameters

1) A Tier 2 evaluation requires examination of soil and groundwater parameters. The parameters that may be varied, and the conditions under which these parameters are determined as part of Tier 2, are summarized in Appendix C, Tables B, ~~and~~ D, and M. If a person proposes to vary site-specific parameters outside of the framework of these tables, the evaluation shall be considered under Tier 3.

2) To determine site-specific physical soil parameters, a minimum of one boring per 0.5 acre of contamination shall be collected. This boring must be deep enough to allow the collection of the required field measurements. The site-specific physical soil parameters must be determined from the portion of the boring representing the stratigraphic unit(s) being evaluated. For example, if evaluating the soil component of the groundwater ingestion exposure route, two samples from the boring will be required:

A) A sample of the predominant soil type for the vadose zone; and

B) A sample of the predominant soil type for the saturated zone.

3) A site-specific SSL dilution factor (used in developing soil remediation objectives based upon the protection of groundwater) may be determined by substituting site information in Equation S22 in Appendix C, Table A. To make this demonstration, a minimum of three monitoring wells shall be used to determine the hydraulic gradient. As an alternative, the default dilution factor value listed in Appendix C, Table B may be used. If monitoring wells are used to determine the hydraulic gradient, the soil taken from the borings shall be visually inspected to ensure there are no significant differences in the stratigraphy. If there are similar soil types in the field, one boring shall be used to determine the site-specific physical soil parameters. If there are significant differences, all of the borings shall be evaluated before determining the site-specific physical soil parameters for the site.

4) Not all of the parameters identified in Appendix C, Tables B, ~~and~~ D, and M need to be determined on a site-specific basis. A person may choose to

collect partial site-specific information and use default values as listed in Appendix C, Tables B, ~~and~~ D, and M for the rest of the parameters.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

SUBPART G: TIER 2 SOIL EVALUATION

Section 742.700 Tier 2 Soil Evaluation Overview

a) Tier 2 remediation objectives are developed through the use of models which allow site-specific data to be considered. Appendix C, Tables A, ~~and~~ C, and L list equations that shall be used under a Tier 2 evaluation to calculate soil remediation objectives prescribed by SSL, ~~and~~ RBCA, and the modified J&E models, respectively. (See also Appendix C, Illustration A.)

b) Appendix C, Table A lists equations that are used under the SSL model. (See also Appendix C, Illustration A.) The SSL model has equations to evaluate the following human exposure routes:

1) Soil ingestion exposure route;

2) Outdoor Inhalation exposure route for:

A) Organic contaminants;

B) Fugitive dust; and

3) Soil component of the groundwater ingestion exposure route.

c) Evaluation of the dermal exposure route is not required under the SSL model.

d) Appendix C, Table C lists equations that are used under the RBCA model. (See also Appendix C, Illustration A.) The RBCA model has equations to evaluate human exposure based on the following:

1) The combined exposure routes of outdoor inhalation of vapors and particulates, soil ingestion and dermal contact with soil;

2) The ~~ambient vapor inhalation (outdoor)~~ outdoor inhalation exposure route from subsurface soils;

e) Appendix C, Table L lists equations that are used under the modified J&E model. The modified J&E model has equations to evaluate human exposure by the indoor inhalation exposure route. The modified model allows for the development of soil remediation objectives and soil gas remediation objectives.

f) ~~e)~~ The equations in either Appendix C, Table A, ~~or~~ C, or L may be used to calculate remediation objectives for each contaminant of concern under Tier 2, if the following requirements are met:

1) The Tier 2 soil remediation objectives for the ingestion and outdoor inhalation exposure routes shall use the applicable equations from the same approach (i.e., SSL equations in Appendix C, Table C). For the indoor inhalation exposure route, only the J&E equations can be used.

2) The equations used to calculate soil remediation objectives for the soil component of the groundwater ingestion exposure route are not dependent on the approach utilized to calculate soil remediation objectives for the other exposure routes. For example, it is acceptable to use the SSL equations for calculating Tier 2 soil remediation objectives for the ingestion and outdoor inhalation exposure routes, and the RBCA equations for calculating Tier 2 soil remediation objectives for the soil component of the groundwater ingestion exposure route.

3) Combining equations from Appendix C, Tables A, ~~and~~ C, and L to form a new model is not allowed. In addition, Appendix C, Tables A, ~~and~~ C, and L must use their own applicable parameters identified in Appendix C, Tables B, ~~and~~ D, and M, respectively.

g) ~~f)~~ In calculating soil remediation objectives for industrial/commercial property use, applicable calculations shall be performed twice: once using industrial/commercial population default values and once using construction worker population default values. The more stringent soil remediation objectives derived from these calculations must be used for further Tier 2 evaluations. The indoor inhalation exposure route does not apply to the construction worker population.

h) ~~g)~~ Tier 2 data sheets provided by the Agency shall be used to present calculated Tier 2 remediation objectives, if required by the particular program for which remediation is being performed.

i) ~~h)~~ The RBCA equations which rely on the parameter Soil Water Sorption Coefficient (k_s) can only be used for ionizing organics and inorganics by substituting values for k_s from Appendix C, Tables I and J, respectively. This will also require the determination of a site-specific value for soil pH.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.705 Parameters for Soil Remediation Objective Equations

a) Appendix C, Tables B, ~~and~~ D, and M list the input parameters for the SSL, ~~and~~ RBCA, and J&E equations, respectively. The first column lists each symbol as it is presented in the equation. The next column defines the parameters. The third column shows the units for the parameters. The fourth column identifies where information on the parameters can be obtained (i.e., field measurement, applicable equation(s), reference source, or default value). The last column identifies how the parameters can be generated.

b) Default Values

Default values are numerical values specified for use in the Tier 2 equations. The fourth column of Appendix C, Tables B, ~~and~~ D, and M denotes if the default values are from the SSL model, RBCA model, the modified J&E model or some other source. The last column of Appendix C, Tables B, ~~and~~ D, and M lists the numerical values for the default values used in the SSL, ~~and~~ RBCA, and J&E equations, respectively.

c) Site-specific Information

Site-specific information is a parameter measured, obtained, or determined from the site to calculate Tier 2 remediation objectives. The fourth column of Appendix C, Tables B, ~~and~~ D, and M identifies those site-specific parameters that may require direct field measurement. For some parameters, numerical default inputs have been provided in the last column of Appendix C, Tables B, ~~and~~ D, and M to substitute for site-specific information. In some cases, information on the receptor or soil type is required to select the applicable numerical default inputs. Site-specific information includes:

1) Physical soil parameters identified in Appendix C, Table F. The second column identifies the location where the sample is to be collected. Acceptable methods for measuring or calculating these soil parameters are identified in the last column of Appendix C, Table F;

2) Institutional controls or engineered barriers, pursuant to Subparts J and K, describe applicable institutional controls and engineered barriers under a Tier 2 evaluation; and

3) Land use classification

d) Toxicological-specific Information

1) Toxicological-specific information is used to calculate Tier 2 remediation objectives for the following parameters, if applicable:

A) Oral Chronic Reference Dose (RfD_o, expressed in mg/kg-d);

B) Oral Subchronic Reference Dose (RfD_s, expressed in mg/kg-d, shall be used for construction worker remediation objective calculations);

C) Oral Slope Factor (SF_o, expressed in $(mg/kg\text{-}d)^{-1}$);

D) Inhalation Unit Risk Factor (URF expressed in $(\mu g/m^3)^{-1}$);

E) Inhalation Chronic Reference Concentration (RfC, expressed in mg/m^3);

F) Inhalation Subchronic Reference Concentration (RfC_s, expressed in mg/m^3, shall be used for construction worker remediation objective calculations);

G) Inhalation Chronic Reference Dose (RfD_i, expressed in mg/kg-d);

H) Inhalation Subchronic Reference Dose (RfD_{is}, expressed in mg/kg-d, shall be used for construction worker remediation objective calculations); and

I) Inhalation Slope Factor (SF_i, expressed in $(mg/kg\text{-}d)^{-1}$);

2) Toxicological information can be obtained ~~from IRIS~~ by following the guidelines in OSWER Directive 9285.7-53, as incorporated by reference in Section 742.210, or the program under which the remediation is being performed.

e) Chemical-specific Information

Chemical-specific information used to calculate Tier 2 remediation objectives is listed in Appendix C, Table E.

f) Calculations

Calculating numerical values for some parameters requires the use of equations listed in Appendix C, Table A, ~~or~~ C, and L. The parameters that are calculated are listed in Appendix C, Tables B, ~~and~~ D, and M.

(Source: Amended at _____ Reg. _____, effective _____)

Section 742.710 SSL Soil Equations

a) This Section sets forth the equations and parameters used to develop Tier 2 soil remediation objectives for the three exposure routes using the SSL approach.

b) Soil Ingestion Exposure Route

1) Equations S1 through S3 form the basis for calculating Tier 2 remediation objectives for the soil ingestion exposure route using the SSL approach. Equation S1 is used to calculate soil remediation objectives for noncarcinogenic contaminants. Equations S2 and S3 are used to calculate soil remediation objectives for carcinogenic contaminants for residential populations and industrial/commercial and construction worker populations, respectively.

2) For Equations S1 through S3, the SSL default values cannot be modified with site-specific information.

c) Outdoor Inhalation Exposure Route

1) Equations S4 through S16, S26 and S27 are used to calculate Tier 2 soil remediation objectives for the outdoor inhalation exposure route using the SSL approach. To address this exposure route, organic contaminants and mercury must be evaluated separately from fugitive dust using their own equations set forth in subsections (c)(2) and (c)(3) of this Section, respectively.

2) Organic Contaminants

A) Equations S4 through S10 are used to calculate Tier 2 soil remediation objectives for organic contaminants and mercury based on the outdoor inhalation exposure route. Equation S4 is used to calculate soil remediation objectives for noncarcinogenic organic contaminants in soil for residential and industrial/commercial populations. Equation S5 is used to calculate soil remediation objectives for noncarcinogenic organic contaminants and mercury in soil for construction worker populations. Equation S6 is used to calculate soil remediation objectives for carcinogenic organic contaminants in soil for residential and industrial/commercial populations. Equation S7 is used to calculate soil remediation objectives for carcinogenic organic contaminants in soil for construction worker populations. Equations S8 through S10, S27 and S28 are used for calculating numerical values for some of the parameters in Equations S4 through S7.

B) For Equation S4, a numerical value for the Volatilization Factor (VF) can be calculated in accordance with subsection (c)(2)(F) of this Section. The remaining parameters in Equation S4 have either SSL default values listed in Appendix C, Table B or toxicological-specific information (i.e., RfC), which can be obtained from IRIS or requested from the program under which the remediation is being performed.

C) For Equation S5, a numerical value for the Volatilization Factor adjusted for Agitation (VF') can be calculated in accordance with subsection (c)(2)(G) of this Section. The remaining parameters in Equation S5 have either SSL default values listed in Appendix C, Table B or toxicological-specific information (i.e., RfC), which can be obtained from IRIS or requested from the program under which the remediation is being performed.

D) For Equation S6, a numerical value for VF can be calculated in accordance with subsection (c)(2)(F) of this Section. The remaining parameters in Equation S6 have either default values listed in Appendix C, Table B or toxicological-specific information (i.e., URF), which can be obtained from IRIS or requested from the program under which the remediation is being performed.

E) For Equation S7, a numerical value for VF' can be calculated in accordance with subsection (c)(2)(G) of this Section. The remaining parameters in Equation S7 have either default values listed in Appendix C, Table B or toxicological-specific information (i.e., URF), which can be obtained from IRIS or requested from the program under which the remediation is being performed.

F) The VF can be calculated for residential and industrial/commercial populations using one of the following equations based on the information known about the contaminant source and receptor population:

i) Equation S8, in conjunction with Equation S10, is used to calculate VF assuming an infinite source of contamination; or

ii) If the area and depth of the contaminant source are known or can be estimated reliably, mass limit considerations may be used to calculate VF using Equation S26.

G) The VF' can be calculated for the construction worker populations using one of the following equations based on the information known about the contaminant source:

i) Equation S9 is used to calculate VF' assuming an infinite source of contamination; or

ii) If the area and depth of the contaminant source are known or can be estimated reliably, mass limit considerations may be used to calculate VF' using Equation S27.

3) Fugitive Dust

A) Equations S11 through S16 are used to calculate Tier 2 soil remediation objectives using the SSL fugitive dust model for the outdoor inhalation exposure route. Equation S11 is used to calculate soil remediation objectives for noncarcinogenic contaminants in fugitive dust for residential and industrial/commercial populations. Equation S12 is used to calculate soil remediation objectives for noncarcinogenic

contaminants in fugitive dust for construction worker populations. Equation S13 is used to calculate soil remediation objectives for carcinogenic contaminants in fugitive dust for residential and industrial/commercial populations. Equation S14 is used to calculate soil remediation objectives for carcinogenic contaminants in fugitive dust for construction worker populations. Equations S15 and S16 are used for calculating numerical quantities for some of the parameters in Equations S11 through S14.

B) For Equation S11, a numerical value can be calculated for the Particulate Emission Factor (PEF) using Equation S15. This equation relies on various input parameters from a variety of sources. The remaining parameters in Equation S11 have either SSL default values listed in Appendix C, Table B or toxicological-specific information (i.e., RfC), which can be obtained from IRIS or requested from the program under which the remediation is being performed.

C) For Equation S12, a numerical value for the Particulate Emission Factor for Construction Worker (PEF') can be calculated using Equation S16. The remaining parameters in Equation S12 have either SSL default values listed in Appendix C, Table B or toxicological-specific information (i.e., RfC), which can be obtained from IRIS or requested from the program under which the remediation is being performed.

D) For Equation S13, a numerical value for PEF can be calculated using Equation S15. The remaining parameters in Equation S13 have either default values listed in Appendix C, Table B or toxicological-specific information (i.e., URF), which can be obtained from IRIS or requested from the program under which the remediation is being performed.

E) For Equation S14, a numerical value for PEF' can be calculated using Equation S16. The remaining parameters in Equation S14 have either default values listed in Appendix C, Table B or toxicological-specific information (i.e., URF), which can be obtained from IRIS or requested from the program under which the remediation is being performed.

d) Soil Component of the Groundwater Ingestion Exposure Route

The Tier 2 remediation objective for the soil component of the groundwater ingestion exposure route can be calculated using one of the following equations based on the information known about the contaminant source and receptor population:

1) Equation S17 is used to calculate the remediation objective assuming an infinite source of contamination.

   A) The numerical quantities for four parameters in Equation S17, the Target Soil Leachate Concentration (C_w), Soil-Water Partition Coefficient (K_d) for non-ionizing organics, Water-Filled Soil Porosity Theta w (θ_w) and Air-Filled Soil Porosity Theta a (θ_a), are calculated using Equations S18, S19, S20 and S21, respectively. Equations S22, S23, S24 and S25 are also needed to calculate numerical values for Equations S18 and S21. The pH-dependent K_d values for ionizing organics can be calculated using Equation S19 and the pH-dependent Koc values in Appendix C, Table I.

   B) The remaining parameters in Equation S17 are Henry's Law Constant (H'), a chemical specific value listed in Appendix C, Table E and Dry Soil Bulk Density (ρ_b), a site-specific based value listed in Appendix C, Table B.

   C) The default value for GW_{obj} is the Tier 1 groundwater objective. For chemicals for which there is no Tier 1 groundwater remediation objective, the value for GW_{obj} shall be the concentration determined according to the procedures specified in 35 Ill. Adm. Code 620, Subpart F. As an alternative to using Tier 1 groundwater remediation objectives or concentrations determined according to the procedures specified in 35 Ill. Adm. Code 620, Subpart F. GW_{obj} may be developed using Equations R25 and R26, if approved institutional controls are in place as required in Subpart J.

2) If the area and depth of the contaminant source are known or can be estimated reliably, mass limit considerations may be used to calculate the remediation objective for this exposure route using Equation S28. The parameters in Equation S28 have default values listed in Appendix C, Table B.

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.715 RBCA Soil Equations

a) This Section presents the RBCA model and describes the equations and parameters used to develop Tier 2 soil remediation objectives.

b) Ingestion, Outdoor Inhalation, and Dermal Contact

1) The two sets of equations in subsections (b)(2) and (b)(3) of this Section shall be used to generate Tier 2 soil remediation objectives for the combined ingestion, outdoor inhalation, and dermal contact with soil exposure routes.

2) Combined Exposure Routes of Soil Ingestion, Outdoor Inhalation of Vapors and Particulates, and Dermal Contact with Soil

A) Equations R1 and R2 form the basis for deriving Tier 2 remediation objectives for the set of equations that evaluates the combined exposure routes of soil ingestion, outdoor inhalation of vapors and particulates, and dermal contact with soil using the RBCA approach. Equation R1 is used to calculate soil remediation objectives for carcinogenic contaminants. Equation R2 is used to calculate soil remediation objectives for noncarcinogenic contaminants. Soil remediation objectives for the ~~ambient vapor inhalation (outdoor)~~ outdoor inhalation exposure route from subsurface soils must also be calculated in accordance with the procedures outlined in subsection (b)(3) of this Section and compared to the values generated from Equations R1 or R2. The smaller value (i.e., R1 and R2 compared to R7 and R8, respectively) from these calculations is the Tier 2 soil remediation objective for the combined exposure routes of soil ingestion, outdoor inhalation, and dermal contact with soil.

B) In Equation R1, numerical values are calculated for two parameters:

i) The volatilization factor for surficial soils (VF_{ss}) using Equations R3 and R4; and

ii) The volatilization factor for subsurface soils regarding particulates (VF_p) using Equation R5.

C) VF_{ss} uses Equations R3 and R4 to derive a numerical value. Equation R3 requires the use of Equation R6. Both equations must be used to calculate the VF_{ss}. The lowest calculated value from these equations must be substituted into Equation R1.

D) The remaining parameters in Equation R1 have either default values listed in Appendix C, Table D or toxicological-specific information (i.e., SF_o, SF_i), which can be obtained from IRIS or requested from the program under which the remediation is being performed.

E) For Equation R2, the parameters VF_{ss} and VF_p are calculated. The remaining parameters in Equation R2 have either default values listed in Appendix C, Table D or toxicological-specific information (i.e., RfD_o, RfD_i), which can be obtained from IRIS or requested from the program under which the remediation is being performed.

F) For chemicals other than inorganics which do not have default values for the dermal absorption factor (RAF_d) in Appendix C, Table D, a dermal absorption factor of 0.5 shall be used for Equations R1 and R2. For inorganics, dermal absorption may be disregarded (i.e., $RAF_d = 0$).

3) ~~Ambient Vapor Inhalation (outdoor)~~ Outdoor Inhalation exposure route from Subsurface Soils (soil below one meter)

A) Equations R7 and R8 form the basis for deriving Tier 2 remediation objectives for the ~~ambient vapor inhalation (outdoor)~~ outdoor inhalation exposure route from subsurface soils using the RBCA approach. Equation R7 is used to calculate soil remediation objectives for carcinogenic contaminants. Equation R8 is used to calculate soil remediation objectives for noncarcinogenic contaminants.

B) For Equation R7, the carcinogenic risk-based screening level for air ($RBSL_{air}$) and the volatilization factor for soils below one meter to ambient air (VF_{samb}) have numerical values that are calculated

using Equations R9 and R11, respectively. Both equations rely on input parameters from a variety of sources.

C) The noncarcinogenic risk-based screening level for air ($RBSL_{air}$) and the volatilization factor for soils below one meter to ambient air (VF_{samb}) in Equation R8 have numerical values that can be calculated using Equations R10 and R11, respectively.

c) Soil Component of the Groundwater Ingestion Exposure Route

1) Equation R12 forms the basis for deriving Tier 2 remediation objectives for the soil component of the groundwater ingestion exposure route using the RBCA approach. The parameters, groundwater at the source (GW_{source}) and Leaching Factor (LF_{sw}), have numerical values that are calculated using Equations R13 and R14, respectively.

2) Equation R13 requires numerical values that are calculated using Equation R15.

3) Equation R14 requires numerical values that are calculated using Equations R21, R22, and R24. For non-ionizing organics, the Soil Water Sorption Coefficient k_s shall be calculated using Equation R20. For ionizing organics and inorganics, the values for (k_s) are listed in Appendix C, Tables I and J, respectively. The pH-dependent k_s values for ionizing organics can be calculated using Equation R20 and the pH-dependent K_{oc} values in Appendix C, Table I. The remaining parameters in Equation R14 are field measurements or default values listed in Appendix C, Table D.

d) The default value for GW_{comp} is the Tier 1 groundwater remediation objective. For chemicals for which there is no Tier 1 groundwater remediation objective, the value for GW_{comp} shall be the concentration determined according to the procedures specified in 35 Ill. Adm. Code 620, Subpart F. As an alternative to using the above concentrations, GW_{comp} may be developed using Equations R25 and R26, if approved institutional controls are in place as may be required in Subpart J.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.717 Indoor Inhalation Equations for Soil and Soil Gas

a) This Section sets forth the equations and parameters to be used to develop Tier 2 soil and soil gas remediation objectives for the indoor inhalation exposure route using the modified J&E model.

b) Equations J&E1 and J&E2 calculate, for carcinogens and noncarcinogens respectively, an acceptable concentration of the contaminant of concern in indoor air that adequately protects humans who inhale this air. Equation J&E3 converts indoor air concentrations from parts per million volume to milligrams per cubic meter.

c) Equation J&E4 calculates an acceptable concentration of the contaminant of concern in the soil gas at the source of contamination. This calculation is made using: (1) an attenuation factor developed in accordance with Equations J&E8b through 18; and (2) the acceptable concentration of the contaminant of concern in indoor air calculated in accordance with Equation J&E1 (for carcinogens) or J&E2 (for noncarcinogens).

d) The attenuation factor (Equation J&E8b) accounts for the following processes:

1) Migration of contaminants from the source upwards through the vadose zone;

2) Migration of contaminants through the earthen filled cracks in the slab-on-grade or basement floor and walls; and

3) Mixing of the contaminants with air inside the building.

e) Equation J&E8b is used where diffusion is the dominant transport mechanism. In this scenario, the Q_{soil} value equals zero.

f) Equations J&E9a through J&E18 calculate input parameters for Equation J&E8b (the equation used to calculate an attenuation factor). These equations assume there are "n" different soil layers between the source of the contamination and the floor of the building. Equations J&E11, 16, 17 and 18 shall be used to calculate the needed parameters for each of the n layers (the general soil layer is referred to as soil layer "i" and i = 1,2, …n). Equations J&E16, 17, and 18 shall also be used to calculate needed parameters for the soil in the cracks of the floor of the building (it is through these cracks that contaminants flow from the subsurface and into the building).

g) The default representative subsurface temperature for Henry's Law Constant is 13°C. This value shall be used, as appropriate, in all calculations needed to represent the system by which contaminants migrate through the subsurface.

h) Equation J&E5 calculates an acceptable soil remediation objective using: (1) the soil gas remediation objective calculated in accordance with Equation J&E4; and (2) the assumption that this gas is in equilibrium with the contaminated soil at the source.

i) The calculated soil remediation objective shall be compared with the saturated soil concentration (C_{sat}, Equation J&E6a) for each chemical with a melting point less than 30°C. The calculated C_{sat} shall use the default representative subsurface temperature specified in 742.717 (g). If the calculated soil remediation objective is greater than C_{sat}, then C_{sat} is used as the soil remediation objective.

j) The calculated soil gas remediation objective shall be compared with the saturated vapor concentration (C_v^{sat}, Equation J&E6b) for each volatile chemical. The calculated C_v^{sat} shall use the default representative subsurface temperature specified in 742.717(g). If the calculated soil gas remediation objective is greater than C_v^{sat}, then C_v^{sat} is used as the soil gas remediation objective.

k) The calculated soil gas remediation objective shall be compared to concentrations of soil gas collected at a depth at least 3 feet below ground surface and above the saturated zone. If a valid sample cannot be collected, a soil gas sampling plan shall be approved by the Agency under Tier 3.

(Source: Added at ___ Ill. Reg. _____, effective _____)

SUBPART H: TIER 2 GROUNDWATER EVALUATION

Section 742.805 Tier 2 Groundwater Remediation Objectives

a) To develop a groundwater remediation objective under this Section that exceeds the applicable Tier 1 groundwater remediation objective, or for which there is no Tier I groundwater remediation objective, a person may request approval from the Agency if the person has performed the following:

1) Identified the horizontal and vertical extent of groundwater for which the Tier 2 groundwater remediation objective is sought;

2) Taken corrective action, to the maximum extent practicable to remove any free product;

3) Using Equation R26 in accordance with Section 742.810, demonstrated that the concentration of any contaminant of concern in groundwater will meet:

   A) The applicable Tier 1 groundwater remediation objective at the point of human exposure; or

   B) For any contaminant of concern for which there is no Tier 1 groundwater remediation objective, the concentration determined according to the procedures specified in 35 Ill. Adm. Code 620 at the point of human exposure. A person may request the Agency to provide these concentrations or may propose these concentrations under Subpart I;

4) Using Equation R26 in accordance with Section 742.810, demonstrated that the concentration of any contaminant of concern in groundwater within the minimum or designated maximum setback zone of an existing potable water supply well will meet the applicable Tier 1 groundwater remediation objective or, if there is no Tier 1 groundwater remediation objective, the concentration determined according to the procedures specified in 35 Ill. Adm. Code 620. A person may request the Agency to provide these concentrations or may propose these concentrations under Subpart I;

5) Using Equation R26 in accordance with Section 742.810, demonstrated that the concentration of any contaminant of concern in groundwater discharging into a surface water will meet the applicable water quality standard under 35 Ill. Adm. Code 302;

6) Demonstrated that the source of the release is not located within the minimum or designated maximum setback zone or within a regulated recharge area of an existing potable water supply well; and

7) If the selected corrective action includes an engineered barrier as set forth in Subpart K to minimize migration of contaminant of concern from the soil to the groundwater, demonstrated that the engineered barrier will remain in place for post-remediation land use through an institutional control as set forth in Subpart J.

b) A groundwater remediation objective that exceeds the water solubility of that chemical (refer to Appendix C, Table E for solubility values) is not allowed.

c) The contaminants of concern for which a Tier 1 remediation objective has been developed shall be included in any mixture of similar-acting chemicals under consideration in Tier 2. The evaluation of 35 Ill. Adm. Code 620.615 regarding mixtures of similar-acting chemicals shall be considered satisfied for Class I groundwater at the point of human exposure if either of the following requirements are achieved:

1) Calculate the weighted average using the following equations:

$$W_{ave} = \frac{x_1}{CUOx_1} + \frac{x_2}{CUOx_2} + \frac{x_3}{CUOx_3} + \ldots + \frac{x_a}{CUOx_a}$$

where:

W_{ave} = Weighted Average

x_1 through x_a = Concentration of each individual contaminant at the location of concern. Note that, depending on the target organ, the actual number of contaminants will range from 2 to 33.

$CUOx_a$ = A Tier 1 or Tier 2 remediation objective must be developed for each x_a.

A) If the value of the weighted average calculated in accordance with the equations above is less than or equal to 1.0, then the remediation objectives are met for those chemicals.

B) If the value of the weighted average calculated in accordance with the equations above is greater than 1.0, then additional remediation must be carried out until the level of contaminants remaining in the remediated area has a weighted average calculated in accordance with the equation above less than or equal to one; or

2) Divide each individual chemical's remediation objective by the number of chemicals in that specific target organ group that were detected at the site. Each of the contaminant concentrations at the site is then compared to the

remediation objectives that have been adjusted to account for this potential additivity.

d) The evaluation of 35 Ill. Adm. Code 620.615 regarding mixtures of similar-acting chemicals are considered satisfied if the cumulative risk from any contaminant(s) of concern listed in Appendix A, Table I, plus any other contaminant(s) of concern detected in groundwater and listed in Appendix A, Table F as affecting the same target organ/organ system as the contaminant(s) of concern detected from Appendix A, Table I, does not exceed 1 in 10,000.

e) Groundwater remediation objectives for the indoor inhalation exposure route shall be developed in accordance with Section 742.812.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.812 Indoor Inhalation Equations

Groundwater remediation objectives for the indoor inhalation exposure route are calculated using the modified J&E model as described in Section 742.717, except as follows:

a) In Equation J&E9a, the total number of layers of soil that contaminants migrate through from the source to the building shall include a capillary fringe layer.

b) The thickness of the capillary fringe layer is 17 cm.

c) The volumetric water content of the capillary fringe shall be 90 % of the total porosity of the soil that comprises the capillary fringe.

d) Equation J&E7 calculates an acceptable groundwater remediation objective. This calculation is made using: (1) the soil gas remediation objective calculated in accordance with Equation J&E4, and (2) the assumption that this gas is in equilibrium with any contamination in the groundwater.

(Source: Added at ___ Ill. Reg. _____, effective _____)

SUBPART I: TIER 3 EVALUATION

Section 742.900 Tier 3 Evaluation Overview

a) Tier 3 sets forth a flexible framework to develop remediation objectives outside of the requirements of Tiers 1 and 2. Although Tier 1 and Tier 2 evaluations are not

prerequisites to conduct Tier 3 evaluations, data from Tier 1 and Tier 2 can assist in developing remediation objectives under a Tier 3 evaluation.

b) The level of detail required to adequately characterize a site depends on the particular use of Tier 3. Tier 3 can require additional investigative efforts beyond those described in Tier 2 to characterize the physical setting of the site. However, in situations where remedial efforts have simply reached a physical obstruction additional investigation may not be necessary for a Tier 3 submittal.

c) Situations that can be considered for a Tier 3 evaluation include, but are not limited to:

1) Modification of parameters not allowed under Tier 2;

2) Use of models different from those used in Tier 2;

3) Use of additional site data to improve or confirm predictions of exposed receptors to contaminants of concern;

4) Analysis of site-specific risks using formal risk assessment, probabilistic data analysis, and sophisticated fate and transport models (e.g., requesting a target hazard quotient greater than 1 or a target cancer risk greater than 1 in 1,000,000);

5) Requests for site-specific remediation objectives because an assessment indicates further remediation is not practical;

6) Incomplete human exposure pathway(s) not excluded under Subpart C;

7) Use of toxicological-specific information not available from the sources listed in Tier 2;

8) Land uses which are substantially different from the assumed residential or industrial/commercial property uses of a site (e.g., a site will be used for recreation in the future and cannot be evaluated in Tier 1 or 2); ~~and~~

9) Requests for site-specific remediation objectives that exceed Tier 1 groundwater remediation objectives so long as the following is demonstrated:

A) *To the extent practical, the exceedance of the groundwater quality standard has been minimized and beneficial use appropriate to the groundwater that was impacted has been returned; and*

B) *Any threat to human health or the environment has been minimized.* [415 ILCS 5/58.5(d)(4)(A)]; and

10) Use of building control technologies, other than those described in Subpart L, to prevent completion of the indoor inhalation exposure route.

d) For requests of a target cancer risk ranging between 1 in 1,000,000 and 1 in 10,000 at the point of human exposure or a target hazard quotient greater than 1 at the point of human exposure, the requirements of Section 742.915 shall be followed. Requests for a target cancer risk exceeding 1 in 10,000 at the point of human exposure are not allowed.

e) Requests for approval of a Tier 3 evaluation must be submitted to the Agency for review under the specific program under which remediation is performed. When reviewing a submittal under Tier 3, the Agency shall consider *whether the interpretations and conclusions reached are supported by the information gathered.* [415 ILCS 58.7(e)(1)]. The Agency shall approve a Tier 3 evaluation if the person submits the information required under this Part and establishes through such information that public health is protected and that specified risks to human health and the environment have been minimized.

f) If contaminants of concern include polychlorinated biphenyls (PCBs), requests for approval of a Tier 3 evaluation must additionally address the applicability of 40 CFR 761.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.920 Impractical Remediation

Any request for site-specific remediation objectives due to impracticality of remediation shall be submitted to the Agency for review and approval. Any request for site-specific remediation objectives due to impracticality of remediation that involves the indoor inhalation exposure route shall follow Section 742.935 in lieu of this Section. A submittal under this Section shall include the following information:

a) The reason(s) why the remediation is impractical;

b) The extent of contamination;

c) Geology, including soil types;

d) The potential impact to groundwater;

e) Results and locations of sampling events;

f) Map of the area, including all utilities and structures; and

g) Present and post-remediation uses of the area of contamination, including human receptors at risk.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.925 Exposure Routes

Technical information may demonstrate that there is no actual or potential impact of contaminants of concern to receptors from a particular exposure route. In these instances, a demonstration excluding an exposure route shall be submitted to the Agency for review and approval. A demonstration that involves the indoor inhalation exposure route shall follow Section 742.935 in lieu of this Section. A submittal under this Section shall include the following information:

a) A description of the route evaluated;

b) A description of the site and physical site characteristics;

c) A discussion of the result and possibility of the route becoming active in the future; and

d) Technical support that may include, but is not limited to, the following:

1) a discussion of the natural or man-made barriers to that exposure route;

2) calculations and modeling;

3) physical and chemical properties of contaminants of concern; and

4) contaminant migration properties.

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(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.935 Indoor Inhalation Exposure Route

a) Site information may demonstrate that there is no actual or potential impact of contaminants of concern to receptors from the indoor inhalation exposure route. In such instances, a demonstration excluding the exposure route shall be submitted to the Agency for review and approval. A submittal under this Section shall include the following information:

1) A description of the site, physical site characteristics, existing and planned buildings, and existing and planned manmade pathways;

2) A discussion of the possibility of the route becoming active in the future; and

3) Site information relevant to the demonstration including, but not limited to, the following:

A) Calculations and modeling used to establish remediation objectives. The calculations and modeling shall account for contaminant transport through the mechanisms of diffusion and advection.

(i) If the contamination is more than 5 feet from an existing or potential building or man-made pathway, a value of zero for the volumetric flow rate of soil gas from the subsurface into the enclosed space shall be used. A Q_{soil} value of zero means that the controlling mode of contaminant transport is diffusion and not advective or pressure-driven movement of contaminants through the soil and into the building.

(ii) If the contamination is within 5 feet of an existing or potential building or man-made pathway, then a Q_{soil} value of 83.33 cm^3/sec shall be used in calculating the Tier 3 remediation objectives, unless additional site-specific information indicates a different remediation objective is reasonable and appropriate.

B) Proposals to use soil gas data, including subslab samples, in establishing remediation objectives. Any proposal to use soil gas data shall meet the requirements of subsection (b) of this Section and Section 742.227.

C) Proposals to use building control technologies supporting the demonstration. Proposals to use building control technologies shall meet subsection (c) of this Section or Subpart L of this Part;

b) Any proposals to use soil gas data, including subslab samples, to establish remediation objectives for the indoor inhalation exposure route shall be submitted to the Agency for review and approval. Proposals to use soil gas data in accordance with Section 742.227 shall follow the requirements of Section 742.227 instead of this Section. A submittal under this Section shall include the following information:

1) Scaled map of the area, showing all buildings and man-made pathways (current and planned);

2) The current extent of contamination;

3) Geology, including soil types;

4) Depth to groundwater (including seasonal variation) and flow direction;

5) Location of soil gas sampling points; and

6) A discussion of soil gas sampling procedures that, at a minimum, addresses the following:

A) sampling equipment;

B) soil gas collection protocol, including field tests and weather conditions; and

C) laboratory analytical methods.

c) Any proposals to use building control technologies as a means to prevent or mitigate human exposures under the indoor inhalation exposure route shall be submitted to the Agency for review and approval. Proposals to use a building control technology in accordance with Subpart L shall follow the requirements of Subpart L instead of this Section. A submittal under this Section shall include the following information:

1) A description of the site and physical site characteristics;

2) The current extent of contamination;

3) Geology, including soil types;

4) Results and locations of sampling events;

5) Scaled map of the area, including all buildings and man-made pathways;

6) A description of building characteristics and methods of construction, including a description of man-made pathways;

7) Present and post-remediation uses of the land above the area of contamination, including human receptors at risk;

8) A description of any building control technologies currently in place or proposed for installation that can reduce or eliminate the potential for completion of the exposure route, including design and construction specifications;

9) Information regarding the effectiveness of any building control technologies currently in place or proposed for installation and a schedule for performance testing to show the effectiveness of the control technology. For buildings not yet constructed, an approved building control technology shall be in place and operational prior to human occupancy;

10) Identification of documents reviewed and the criteria used in the documents for determining whether building control technologies are effective and how those criteria compare to existing or potential buildings or man-made pathways at the site; and

11) A description as to how the effectiveness of the building control technologies will be operated and maintained for the life of the buildings and man-made pathways, or until soil and groundwater contaminant concentrations have reached remediation objectives that are approved by the Agency. This includes provisions for potential extended system inoperability due to power failure or other disruption.

(Source: Added at ___ Ill. Reg. _____, effective _____)

SUBPART J: INSTITUTIONAL CONTROLS

Section 742.1000 Institutional Controls

a) Institutional controls in accordance with this Subpart must be placed on the property when remediation objectives are based on any of the following assumptions:

1) Industrial/Commercial property use;

2) Target cancer risk greater than 1 in 1,000,000;

3) Target hazard quotient greater than 1;

4) Engineered barriers;

5) The point of human exposure is located at a place other than at the source;

6) Exclusion of exposure routes; ~~or~~

7) Use of an indoor inhalation building control technology; or

8) ~~7)~~ Any combination of the above.

b) The Agency shall not approve any remediation objective under this Part that is based on the use of institutional controls unless the person has proposed institutional controls meeting the requirements of this Subpart and the requirements of the specific program under which the institutional control is proposed. A proposal for approval of institutional controls shall provide identification of the selected institutional controls from among the types recognized in this Subpart.

c) The following instruments may be institutional controls subject to the requirements of this Subpart J and the requirements of the specific program under which the institutional control is proposed:

1) No Further Remediation Letters;

2) Environmental Land Use Controls;

3) Land Use Control Memoranda of Agreement;

4) Ordinances adopted and administered by a unit of local government;

5) Agreements between a property owner (or, in the case of a petroleum leaking underground storage tank, the owner or operator of the tank) and a highway authority with respect to any contamination remaining under highways; and

6) Agreements between a highway authority, which is also the property owner (or, in the case of a petroleum leaking underground storage tank, the owner or operator of the tank) and the Agency with respect to any contamination remaining under the highways.

d) No Further Remediation Letters and Environmental Land Use Controls that meet the requirements of this Subpart and the recording requirements of the program under which remediation is being performed are transferred with the property.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.1010 Environmental Land Use Controls

a) An Environmental Land Use Control (ELUC) is an institutional control that may be used under this Part to impose land use limitations or requirements related to environmental contamination. ELUCs are only effective when approved by the Agency in accordance with this Part. Activities or uses that may be limited or required include, but are not limited to, prohibition of use of groundwater for potable purposes, restriction to industrial/commercial uses, operation or maintenance of engineered barriers, indoor inhalation building control technologies, or worker safety plans. ELUCs may be used in the following circumstances:

1) When No Further Remediation Letters are not available, including but not limited to when contamination has migrated off-site or outside the remediation site; or

2) When No Further Remediation Letters are not issued under the program for which a person is undergoing remediation.

b) Recording requirements:

1) An ELUC approved by the Agency pursuant to this Section must be recorded in the Office of the Recorder or Registrar of Titles for the county in which the property that is the subject of the ELUC is located. A copy of the ELUC demonstrating that it has been recorded must be submitted to

the Agency before the Agency will issue a no further remediation determination.

2) An ELUC approved under this Section will not become effective until officially recorded in the chain of title for the property that is the subject of the ELUC in accordance with subsection (b)(1) of this Section.

3) Reference to the recorded ELUC must be made in the instrument memorializing the Agency's no further remediation determination. Recording of the no further remediation determination and confirmation of recording must be in accordance with the requirements of the program under which the determination was issued.

4) The requirements of this Section do not apply to Federally Owned Property for which the Federal Landholding Entity does not have the authority under federal law to record land use limitations on the chain of title.

5) The requirements of this Section apply only to those sites for which a request for a no further remediation determination has not yet been made to the Agency by January 6, 2001.

c) Duration:

1) Except as provided in this subsection (c), an ELUC shall remain in effect in perpetuity.

2) At no time shall any site for which an ELUC has been imposed as a result of remediation activities under this Part be used in a manner inconsistent with the land use limitation unless attainment of objectives appropriate for the new land use is achieved and a new no further remediation determination has been obtained and recorded in accordance with the program under which the ELUC was first imposed or the Site Remediation Program (35 Ill. Adm. Code 740). [415 ILCS 58.8(c)]. In addition, the appropriate release or modification of the ELUC must be prepared by the Agency and filed on the chain of title for the property that is the subject of the ELUC.

A) For a Leaking Underground Storage Tank (LUST) site under 35 Ill. Adm. Code 731 or 732 or a Site Remediation Program site under 35 Ill. Adm. Code 740, an ELUC may be released or

modified only if the NFR Letter is also modified under the Site Remediation Program to reflect the change;

B) For a RCRA site under 35 Ill. Adm. Code 721 730, an ELUC may be released or modified only if there is also an amended certification of closure or a permit modification.

3) In addition to any other remedies that may be available, a failure to comply with the limitations or requirements of an ELUC may result in voidance of an Agency no further remediation determination in accordance with the program under which the determination was made. The failure to comply with the limitations or requirements of an ELUC may also be grounds for an enforcement action pursuant to Title VIII of the Act.

d) An ELUC submitted to the Agency must match the form and contain the same substance, except for variable elements (e.g., name of property owner), as the model in Appendix F and must contain the following elements:

1) Name of property owners and declaration of property ownership;

2) Identification of the property to which the ELUC applies by common address, legal description, and Real Estate Tax Index/Parcel Index Number;

3) A reference to the Bureau of Land LPC numbers or 10-digit identification numbers under which the remediation was conducted;

4) A statement of the reason for the land use limitation or requirement relative to protecting human health and the surrounding environment from soil, groundwater, and/or other environmental contamination;

5) The language instituting such land use limitations or requirements;

6) A statement that the limitations or requirements apply to the current owners, occupants, and all heirs, successors, assigns, and lessees;

7) A statement that the limitations or requirements apply in perpetuity or until:

A) The Agency determines that there is no longer a need for the ELUC;

B) The Agency, upon written request, issues to the site that received the no further remediation determination that relies on the ELUC a new no further remediation determination approving modification or removal of the limitations or requirements;

C) The new no further remediation determination is filed on the chain of title of the site subject to the no further remediation determination; and

D) A release or modification of the land use limitation is filed on the chain of title for the property that is the subject of the ELUC;

8) Scaled site maps showing:

A) The legal boundary of the property to which the ELUC applies;

B) The horizontal and vertical extent of contaminants of concern above applicable remediation objectives for soil and groundwater to which the ELUC applies;

C) Any physical features to which an ELUC applies (e.g., engineered barriers, monitoring wells, caps, indoor inhalation building control technologies); and

D) The nature, location of the source, and direction of movement of the contaminants of concern;

9) A statement that any information regarding the remediation performed on the property for which the ELUC is necessary may be obtained from the Agency through a request under the Freedom of Information Act [5 ILCS 140] and rules promulgated thereunder; and

10) The dated, notarized signatures of the property owners or authorized agent.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.1015 Ordinances

a) An ordinance adopted by a unit of local government that effectively prohibits the installation of potable water supply wells (and the use of such wells) may be used as an institutional control to meet the requirements of Section 742.320(d) or 742.805(a)(3) if the requirements of this Section are met. A model ordinance is found in Appendix G. Ordinances prohibiting the installation of potable water supply wells (and the use of such wells) that do not expressly prohibit the installation of potable water supply wells (and the use of such wells) by units of local government may be acceptable as institutional controls if the requirements of this Section are met and a Memorandum of Understanding (MOU) is entered into under subsection (i) of this Section. For purposes of this Section, a unit of local government is considered to be expressly prohibited from installing and using potable water supply wells only if the unit of local government is included in the prohibition provision by name. The prohibition required by this Section shall satisfy the following requirements at a minimum:

1) The prohibition shall not allow exceptions for potable water well installation and use other than for the adopting unit of local government;

2) The prohibition shall apply at all depths and shall not be limited to particular aquifers or other geologic formations;

3) If the prohibition does not apply everywhere within the boundaries of the unit of local government, the limited area to which the prohibition applies shall be easily identifiable and clearly defined by the ordinance (e.g., narrative descriptions accompanied by maps with legends or labels showing prohibition boundaries, narrative descriptions using fixed, common reference points such as street names). Boundaries of prohibitions limited by area shall be fixed by the terms of the ordinance and shall not be subject to change without amending the ordinance in which the prohibition has been adopted (e.g., no boundaries defined with reference to zoning districts or the availability of the public water supply); and

4) The prohibition shall not in any way restrict or limit the Agency's approval of the use of the ordinance as an institutional control pursuant to this Part (e.g., no restrictions based on remediation program participation, no restrictions on persons performing remediation within the prohibition area who may use the ordinance).

b) A request for approval of a local ordinance as an institutional control shall provide the following:

1) A copy of the ordinance restricting groundwater use certified by an official of the unit of local government in which the site is located that it is a true and accurate copy of the ordinance, unless the Agency and the unit of local government have entered an agreement under subsection (i) of this Section, in which case the request may alternatively reference the MOU. The ordinance must demonstrate that potable use of groundwater from potable water supply wells is prohibited;

2) A scaled map(s) delineating the area and extent of groundwater contamination modeled above the applicable remediation objectives including any measured data showing concentrations of contaminants of concern in which the applicable remediation objectives are exceeded;

3) A scaled map delineating the boundaries of all properties under which groundwater is located which exceeds the applicable groundwater remediation objectives;

4) Information identifying the current owner(s) of each property identified in subsection (b)(3) of this Section; and

5) A copy of the proposed written notification to the unit of local government that adopted the ordinance and to the current owners identified in subsection (b)(4) of this Section that includes the following information:

A) The name and address of the unit of local government that adopted the ordinance;

B) The ordinance's citation;

C) A description of the property being sent notice by adequate legal description, reference to a plat showing the boundaries of the property, or by accurate street address;

D) Identification of the party requesting to use the groundwater ordinance as an institutional control, and a statement that the party has requested approval from the Agency to use the ordinance as an institutional control;

E) A statement that use of the ordinance as an institutional control allows contamination above groundwater ingestion remediation objectives to remain in groundwater beneath the affected properties, and that the ordinance strictly prohibits human and domestic consumption of the groundwater;

F) A statement as to the nature of the release and response action with the site name, site address, and Agency site number or Illinois inventory identification number; and

G) A statement that more information about the remediation site may be obtained by contacting the party requesting the use of the groundwater ordinance as an institutional control or by submitting a FOIA request to the Agency.

c) Written notification proposed pursuant to subsection (b)(5) of this Section must be sent to the unit of local government that adopted the ordinance as well as all current property owners identified in subsection (b)(4). Written proof that the notification was sent to the unit of local government and the property owners shall be submitted to the Agency within 45 days from the date the Agency's no further remediation determination is recorded. Such proof may consist of the return card from certified mail, return receipt requested, a notarized certificate of service, or a notarized affidavit.

d) Unless the Agency and the unit of local government have entered into a MOU under subsection (i) of this Section, the current owner or successors in interest of a site who have received approval of use of an ordinance as an institutional control under this Section shall:

1) Monitor activities of the unit of local government relative to variance requests or changes in the ordinance relative to the use of potable groundwater at properties identified in subsection (b)(3) of this Section; and

2) Notify the Agency of any approved variance requests or ordinance changes within 30 days after the date such action has been approved.

e) The information required in subsections (b)(1) through (b)(5) of this Section and the Agency letter approving the groundwater remediation objective shall be submitted to the unit of local government. Proof that the information has been filed with the unit of local government shall be provided to the Agency.

f) Any ordinance or MOU used as an institutional control pursuant to this Section shall be recorded in the Office of the Recorder or Registrar of Titles of the county in which the site is located together with the instrument memorializing the Agency's no further remediation determination pursuant to the specific program within 45 days after receipt of the Agency's no further remediation determination.

g) An institutional control approved under this Section shall not become effective until officially recorded in accordance with subsection (f) of this Section. The person receiving the approval shall obtain and submit to the Agency within 30 days after recording a copy of the institutional control demonstrating that it has been recorded.

h) The following shall be grounds for voidance of the ordinance as an institutional control and the instrument memorializing the Agency's no further remediation determination:

1) Modification of the ordinance by the unit of local government to allow potable use of groundwater;

2) Approval of a site-specific request, such as a variance, to allow potable use of groundwater at a site identified in subsection (b)(3) of this Section;

3) Violation of the terms of an institutional control recorded under Section 742.1005 or Section 742.1010; or

4) Failure to provide notification and proof of such notification pursuant to subsection (c) of this Section.

i) The Agency and a unit of local government may enter into a MOU under this Section if the unit of local government has adopted an ordinance satisfying subsection (a) of this Section and if the requirements of this subsection are met. The MOU submitted to the Agency must match the form and contain the same substance as the model in Appendix H and shall include the following:

1) Identification of the authority of the unit of local government to enter the MOU;

2) Identification of the legal boundaries, or equivalent, under which the ordinance is applicable;

3) A certified copy of the ordinance;

4) A commitment by the unit of local government to notify the Agency of any variance requests or proposed ordinance changes at least 30 days prior to the date the local government is scheduled to take action on the request or proposed change;

5) A commitment by the unit of local government to maintain a registry of all sites within the unit of local government that have received no further remediation determinations pursuant to specific programs; and

6) If the ordinance does not expressly prohibit the installation of potable water supply wells (and the use of such wells) by units of local government, a commitment by the unit of local government:

A) To review the registry of sites established under subsection (i)(5) of this Section prior to siting potable water supply wells within the area covered by the ordinance;

B) To determine whether the potential source of potable water may be or has been affected by contamination left in place at those sites; and

C) To take whatever steps are necessary to ensure that the potential source of potable water is protected from the contamination or treated before it is used as a potable water supply.

j) A groundwater ordinance may not be used to exclude the indoor inhalation exposure route.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

SUBPART K: ENGINEERED BARRIERS

Section 742.1105 Engineered Barrier Requirements

a) Natural attenuation, access controls, and point of use treatment shall not be considered engineered barriers. Engineered barriers may not be used to prevent direct human exposure to groundwater without the use of institutional controls.

b) For purposes of determining remediation objectives under Tier 1, engineered barriers are not recognized.

c) The following engineered barriers are recognized for purposes of calculating remediation objectives that exceed residential remediation objectives:

1) For the soil component of the groundwater ingestion exposure route, the following engineered barriers are recognized if they prevent completion of the exposure pathway:

A) Caps or walls constructed of compacted clay, asphalt, concrete or other material approved by the Agency; and

B) Permanent structures such as buildings and highways.

2) For the soil ingestion exposure route, the following engineered barriers are recognized if they prevent completion of the exposure pathway:

A) Caps or walls constructed of compacted clay, asphalt, concrete, or other material approved by the Agency;

B) Permanent structures such as buildings and highways; and

C) Soil, sand, gravel, or other geologic materials that:

i) Cover the contaminated media;

ii) Meet the soil remediation objectives under Subpart E for residential property for contaminants of concern; and

iii) Are a minimum of three feet in depth.

3) For the <u>outdoor</u> inhalation exposure route, the following engineered barriers are recognized if they prevent completion of the exposure pathway:

A) Caps or walls constructed of compacted clay, asphalt, concrete, or other material approved by the Agency;

B) Permanent structures such as buildings and highways; and

C) Soil, sand, gravel, or other geologic materials that:

i) Cover the contaminated media;

ii) Meet the soil remediation objectives under Subpart E for residential property for contaminants of concern; and

iii) Are a minimum of ten feet in depth and not within ten feet of any manmade pathway.

4) For the ingestion of groundwater exposure route, the following engineered barriers are recognized if they prevent completion of the exposure pathway:

A) Slurry walls; and

B) Hydraulic control of groundwater.

d) Unless otherwise prohibited under Section 742.1100, any other type of engineered barrier may be proposed if it will be as effective as the options listed in subsection (c) of this Section.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

SUBPART L: BUILDING CONTROL TECHNOLOGIES

Section 742.1200 Building Control Technologies

a) Any person who develops remediation objectives under this Part based on building control technologies shall meet the requirements of this Subpart and the requirements of Subpart J relative to institutional controls.

b) The Agency shall not approve any remediation objective under this Part that is based on the use of building control technologies unless the person has proposed building control technologies meeting the requirements of this Subpart and Subpart J relative to institutional controls.

c) The use of building control technologies can be recognized in determining remediation objectives only if the building control technologies are intended for use as part of the final corrective action.

d) For buildings not yet constructed, an approved building control technology shall be in place and operational prior to human occupancy.

e) Any no further remediation determination based upon the use of building control technologies shall require effective maintenance of the building control technology. The maintenance requirements shall be included in an institutional control under Subpart J. This institutional control shall address provisions for inoperability by requiring the following if the building control technology is rendered inoperable:

1) The site owner/operator shall notify building occupants and workers in advance of intrusive activities. Such notification shall enumerate the contaminant of concern known to be present; and

2) The site owner/operator shall require building occupants and workers to implement protective measures consistent with good industrial hygiene practice.

f) Failure to maintain a building control technology in accordance with that no further remediation determination shall be grounds for voidance of the determination and the instrument memorializing the Agency's no further remediation determination.

(Source: Added at ___ Ill. Reg. _____, effective _____)

Section 742.1205 Building Control Technology Proposals

A proposal to use a building control technology under this Subpart shall include the following information:

a) A description of the site and physical site characteristics;

b) The current extent and modeled migration of contamination;

c) Geology, including soil types;

d) Results and locations of sampling events;

e) Scaled map of the area, including all buildings and man-made pathways;

f) A description of building characteristics and methods of construction, including a description of man-made pathways; and

g) Present and post-remediation uses of the land above the area of contamination, including human receptors at risk.

(Source: Added at ___ Ill. Reg. _____, effective _____)

Section 742.1210 Building Control Technology Requirements

a) Natural attenuation, access controls, and point of use treatment shall not be considered building control technologies.

b) For purposes of determining remediation objectives under Tier 1, building control technologies are not recognized.

c) The following building control technologies are recognized for purposes of determining remediation objectives that exceed residential remediation objectives:

1) Sub-slab depressurization (SSD) systems meeting the following requirements:

A) A suction pit is installed that is at least 4 cubic feet and extends at least 16 inches below the slab;

B) A PVC pipe of at least 4 inches in diameter extends from the suction pit to the intake side of an in-line fan with a flow rate of at least 5.7 cubic meters/min at 249 pascals;

C) All visible cracks and joints in the slab (including the place where the pipe exits the slab) are sealed;

D) The pipe exhausts outside the building at least 10 feet above ground and at least 10 feet from any door or window; and

E) An additional suction pit meeting the requirements of (A) shall be installed in any area separated by a sub-slab grade beam.

2) Sub-membrane depressurization (SMD) systems meeting the following requirements:

A) A non-woven geotextile is installed on the exposed earthen material;

B) A cross-laminated polyethylene membrane liner at least 0.15 mm (or 6 mil) thick is placed over the geotextile and sealed to foundation walls using acrylic latex adhesive;

C) A 4-inch diameter PVC pipe extends from a hole cut in the liner to the intake side of an in-line fan with a flow rate of at least 5.7 cubic meters/min at 249 pascals;

D) The pipe is sealed to the liner;

E) The pipe exhausts outside the building at least 10 feet above ground and at least 10 feet from any door or window; and

F) A smoke test of the membrane system, in accordance with the manufacturer's requirements, is preformed to ensure no leaks exist. Where leaks are identified, appropriate repairs are undertaken and smoke testing repeated until no leaks are detected.

3) Membrane barrier systems meeting the following requirements:

A) The membrane is impermeable to volatile chemicals and is not less than 1.5 mm (or 60 mil) thick;

B) The membrane is sealed to foundation walls and any penetrating pipes;

C) The membrane is installed in accordance with the manufacturer's requirements and by an applicator trained and approved by the manufacturer.

D) A smoke test of the membrane system, in accordance with the manufacturer's requirements, is performed to ensure no leaks exist. Where leaks are identified, appropriate repairs are undertaken and smoke testing repeated until no leaks are detected;

E) The membrane is puncture resistant to slab installation construction activities; and

F) Construction activities following membrane installation do not damage, puncture or tear the membrane or otherwise compromise its ability to prevent the migration of volatile chemicals.

4) Geologic materials meeting the following requirements:

A) The geologic materials cover the contaminated soil and groundwater;

B) The geologic materials meet the soil remediation objectives for the indoor inhalation exposure route under Subpart E for residential property for the contaminants of concern; and

C) The geologic materials have sufficient depth such that, using Tier 2 or Tier 3 evaluation procedures as approved by the Agency, completion of the exposure route is prevented for any building or man-made pathway.

(Source: Added at ___ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX A: General

Section 742.TABLE A: Soil Saturation Limits (C_{sat}) for Chemicals Whose Melting Point is Less than 30° C

~~CAS No.~~	~~Chemical Name~~	~~C_{sat} (mg/kg)~~
~~67-64-1~~	~~Acetone~~	~~100,000~~
~~71-43-2~~	~~Benzene~~	~~870~~
~~111-44-4~~	~~Bis(2-chloroethyl)ether~~	~~3,300~~
~~117-81-7~~	~~Bis(2-ethylhexyl)phthalate~~	~~31,000~~
~~75-27-4~~	~~Bromodichloromethane (Dichlorobromomethane)~~	~~3,000~~
~~75-25-2~~	~~Bromoform~~	~~1,900~~
~~71-36-3~~	~~Butanol~~	~~10,000~~
~~85-68-7~~	~~Butyl benzyl phthalate~~	~~930~~
~~75-15-0~~	~~Carbon disulfide~~	~~720~~
~~56-23-5~~	~~Carbon tetrachloride~~	~~1,100~~
~~108-90-7~~	~~Chlorobenzene (Monochlorobenzene)~~	~~680~~
~~124-48-1~~	~~Chlorodibromomethane (Dibromochloromethane)~~	~~1,300~~
~~67-66-3~~	~~Chloroform~~	~~2,900~~
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1,400~~
~~106-93-4~~	~~1,2-Dibromoethane (Ethylene dibromide)~~	~~2,800~~
~~84-74-2~~	~~Di-*n*-butyl phthalate~~	~~2,300~~
~~95-50-1~~	~~1,2-Dichlorobenzene (o-Dichlorobenzene)~~	~~560~~
~~75-34-3~~	~~1,1-Dichloroethane~~	~~1,700~~
~~107-06-2~~	~~1,2-Dichloroethane (Ethylene dichloride)~~	~~1,800~~
~~75-35-4~~	~~1,1-Dichloroethylene~~	~~1,500~~
~~156-59-2~~	~~*cis*-1,2-Dichloroethylene~~	~~1,200~~
~~156-60-5~~	~~*trans*-1,2-Dichloroethylene~~	~~3,100~~
~~78-87-5~~	~~1,2-Dichloropropane~~	~~1,100~~
~~542-75-6~~	~~1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)~~	~~1,400~~
~~84-66-2~~	~~Diethyl phthalate~~	~~2,000~~

117-84-0	Di *n*-octyl phthalate	10,000
100-41-4	Ethylbenzene	400
77-47-4	Hexachlorocyclopentadiene	2,200
78-59-1	Isophorone	4,600
74-83-9	Methyl bromide (Bromomethane)	3,200
1634-04-4	Methyl tertiary-butyl ether	8,800
75-09-2	Methylene chloride (Dichloromethane)	2,400
98-95-3	Nitrobenzene	1,000
100-42-5	Styrene	1,500
127-18-4	Tetrachloroethylene (Perchloroethylene)	240
108-88-3	Toluene	650
120-82-1	1,2,4-Trichlorobenzene	3,200
71-55-6	1,1,1-Trichloroethane	1,200
79-00-5	1,1,2-Trichloroethane	1,800
79-01-6	Trichloroethylene	1,300
108-05-4	Vinyl acetate	2,700
75-01-4	Vinyl chloride	1,200
108-38-3	m-Xylene	420
95-47-6	o-Xylene	410
106-42-3	p-Xylene	460
1330-20-7	Xylenes (total)	320
	Ionizable Organics	
95-57-8	2-Chlorophenol	53,000

CAS No.	Chemical Name	For the Outdoor Inhalation Exposure Route[a] C_{sat} (mg/kg)	For the Soil Component of the Groundwater Ingestion Exposure Route[b] C_{sat} (mg/kg)
67-64-1	Acetone	1.00E+05	2.00E+05
71-43-2	Benzene	8.00E+02	5.80E+02
111-44-4	Bis(2-chloroethyl)ether	3.00E+03	3.90E+03
117-81-7	Bis(2-ethylhexyl)phthalate	2.00E+02	6.80E+01
75-27-4	Bromodichloromethane (Dichlorobromomethane)	2.80E+03	2.00E+03
75-25-2	Bromoform	2.00E+03	1.20E+03
71-36-3	Butanol	1.00E+04	1.60E+04
78-93-3	2-Butanone (MEK)	2.50E+04	4.50E+04
85-68-7	Butyl benzyl phthalate	1.00E+03	3.40E+02
75-15-0	Carbon disulfide	8.50E+02	5.20E+02
56-23-5	Carbon tetrachloride	1.20E+03	5.60E+02
108-90-7	Chlorobenzene (Monochlorobenzene)	6.20E+02	2.90E+02
124-48-1	Chlorodibromomethane (Dibromochloromethane)	1.40E+03	8.90E+02
67-66-3	Chloroform	3.40E+03	2.50E+03
95-57-8	2-Chlorophenol [b] (ionizable organic)	1.00E+05	7.00E+04
75-99-0	Dalapon	1.20E+05	1.90E+05
96-12-8	1,2-Dibromo-3-chloropropane	6.90E+02	4.30E+02
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	1.60E+03	1.20E+03
84-74-2	Di-*n*-butyl phthalate	2.60E+03	8.80E+02
95-50-1	1,2-Dichlorobenzene (o-Dichlorobenzene)	5.60E+02	2.10E+02
75-71-8	Dichlorofluoromethane	8.70E+04	4.30E+02

CAS No.	Chemical Name	For the Outdoor Inhalation Exposure Route[a] C_{sat} (mg/kg)	For the Soil Component of the Groundwater Ingestion Exposure Route[b] C_{sat} (mg/kg)
75-34-3	1,1-Dichloroethane	1.70E+03	1.40E+03
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	1.90E+03	2.10E+03
75-35-4	1,1-Dichloroethylene	1.40E+03	9.10E+02
156-59-2	*cis*-1,2-Dichloroethylene	1.30E+03	1.00E+03
156-60-5	*trans*-1,2-Dichloroethylene	3.00E+03	2.10E+03
78-87-5	1,2-Dichloropropane	1.20E+03	8.70E+02
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	1.00E+03	8.50E+02
84-66-2	Diethyl phthalate	2.20E+03	9.20E+02
105-67-9	2,4-Dimethylphenol	1.00E+04	4.70E+03
117-84-0	Di-*n*-octyl phthalate	1.60E+01	5.20E+00
123-91-1	p-Dioxane	1.00E+05	2.00E+05
100-41-4	Ethylbenzene	3.50E+02	1.50E+02
77-47-4	Hexachlorocyclopentadiene	1.30E+02	4.40E+01
78-59-1	Isophorone	3.00E+03	3.00E+03
98-82-8	Isopropylbenzene (Cumene)	9.40E+02	4.00E+02
7439-97-6	Mercury (elemental)	3.10E+00	3.10E+00
72-43-5	Methoxychlor	1.40E+01	4.50E+00
74-83-9	Methyl bromide (Bromomethane)	3.10E+03	3.60E+03
1634-04-4	Methyl tertiary-butyl ether	8.40E+03	1.10E+04
75-09-2	Methylene chloride (Dichloromethane)	2.50E+03	3.00E+03
98-95-3	Nitrobenzene	7.10E+02	5.90E+02

CAS No.	Chemical Name	For the Outdoor Inhalation Exposure Route[a] C_{sat} (mg/kg)	For the Soil Component of the Groundwater Ingestion Exposure Route[b] C_{sat} (mg/kg)
621-64-7	n-Nitrosodi-n-propylamine	1.90E+03	2.30E+03
100-42-5	Styrene	6.30E+02	2.60E+02
127-18-4	Tetrachloroethylene (Perchloroethylene)	8.00E+02	3.10E+02
108-88-3	Toluene	5.80E+02	2.90E+02
120-82-1	1,2,4-Trichlorobenzene	3.40E+02	1.20E+02
71-55-6	1,1,1-Trichloroethane	1.30E+03	6.70E+02
79-00-5	1,1,2-Trichloroethane	1.80E+03	1.30E+03
79-01-6	Trichloroethylene	1.20E+03	6.50E+02
75-69-4	Trichlorofluoromethane	1.80E+03	8.90E+02
108-05-4	Vinyl acetate	2.26E+03	4.20E+03
75-01-4	Vinyl chloride	2.60E+03	2.90E+03
108-38-3	m-Xylene	4.10E+02	1.60E+02
95-47-6	o-Xylene	3.70E+02	1.50E+02
106-42-3	p-Xylene	3.30E+02	1.40E+02
1330-20-7	Xylenes (total)	2.80E+02	1.10E+02

[a] Soil Saturation Limits calculated using an foc of 0.006 g/g and a system temperature of 25°C.
[b] Soil Saturation Limits calculated using an foc of 0.002 g/g and a system temperature of 25°C.
[c] C_{sat} for pH of 6.8. If soil pH is other than 6.8, a site-specific C_{sat} should be calculated using equations S19 and S29 and the pH-specific Koc values in Appendix C Table I.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX A General

Section 742.TABLE E Similar-Acting Noncarcinogenic Chemicals

~~**Adrenal Gland**~~
~~Nitrobenzene~~
~~1,2,4-Trichlorobenzene (Ingestion only)~~

~~**Kidney**~~
~~Acetone (Ingestion only)~~
~~Cadmium (Ingestion only)~~
~~Chlorobenzene~~
~~Dalapon~~
~~1,1-Dichloroethane~~
~~Di-n-octyl phthalate (Ingestion only)~~
~~Endosulfan~~
~~Ethylbenzene~~
~~Fluoranthene~~
~~Methyl tertiary-butyl ether (Inhalation only)~~
~~Nitrobenzene~~
~~Pyrene~~
~~Toluene (Ingestion only)~~
~~2,4,5-Trichlorophenol~~
~~Vinyl acetate (Ingestion only)~~

~~Liver~~
~~Acenaphthene~~
~~Acetone (Ingestion only)~~
~~Butylbenzyl phthalate (Ingestion only)~~
~~Chlorobenzene (Ingestion only)~~
~~1,1-Dichloroethylene (Ingestion only)~~
~~Di-n-octyl phthalate (Ingestion only)~~
~~Endrin~~
~~Ethylbenzene~~
~~Fluoranthene~~
~~Methyl tertiary-butyl ether (Inhalation only)~~
~~Nitrobenzene~~
~~Picloram~~
~~Styrene (Ingestion only)~~
~~2,4,5-TP (Silvex)~~
~~Toluene (Ingestion only)~~
~~1,2,4-Trichlorobenzene (Inhalation only)~~
~~2,4,5-Trichlorophenol~~

~~**Central Nervous System**~~
~~Butanol (Ingestion only)~~
~~Cyanide (amenable)~~
~~2,4-Dimethylphenol~~
~~Endrin~~
~~Manganese~~
~~2-Methylphenol~~
~~Mercury (Inhalation only)~~
~~Styrene (Inhalation only)~~
~~Toluene (Inhalation only)~~
~~Xylenes (Ingestion only)~~

~~Circulatory System~~
~~Antimony~~
~~Barium (Ingestion only)~~
~~2,4-D~~
~~cis-1,2-Dichloroethylene (Ingestion only)~~
~~Nitrobenzene~~
~~trans-1,2-Dichloroethylene (Ingestion only)~~
~~2,4-Dimethylphenol~~
~~Fluoranthene~~
~~Fluorene~~
~~Styrene (Ingestion only)~~
~~Zinc~~

~~Gastrointestinal System~~
~~Beryllium (Ingestion only)~~
~~Endothall~~
~~Hexachlorocyclopentadiene (Ingestion only)~~
~~Methyl bromide (Ingestion only)~~
~~Methyl tertiary-butyl ether (Ingestion only)~~

~~Immune System~~
~~2,4-Dichlorophenol~~
~~p-Chloroaniline~~
~~Mercury (Ingestion only)~~

~~Reproductive System~~
~~Barium (Inhalation only)~~
~~Boron (Ingestion only)~~
~~Carbon disulfide~~
~~2-Chlorophenol (Ingestion only)~~
~~1,2-Dibromo-3-Chloropropane (Inhalation only)~~
~~Dinoseb~~
~~Ethylbenzene (Inhalation only)~~
~~Methoxychlor~~
~~Phenol~~

~~Respiratory System~~
~~1,2-Dichloropropane (Inhalation only)~~
~~1,3-Dichloropropylene (Inhalation only)~~
~~Hexachlorocyclopentadiene (Inhalation only)~~
~~Methyl bromide (Inhalation only)~~
~~Naphthalene (Inhalation only)~~
~~Toluene (Inhalation only)~~
~~Vinyl acetate (Inhalation only)~~

~~Cholinesterase Inhibition~~
~~Aldicarb~~
~~Carbofuran~~

~~Decreased Body Weight Gains and Circulatory System Effects~~
~~Atrazine~~
~~Simazine~~

Adrenal Gland
Isopropylbenzene

Cholinesterase Inhibition
Aldicarb
Carbofuran

Circulatory System
Alachlor
Antimony (ingestion only)
Benzene
Cobalt (ingestion only)
2,4-D
cis-1,2-Dichloroethylene (ingestion only)
2,4-Dimethylphenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Ensosulfan
Fluoranthene
Fluorene
Methylene Chloride (inhalation only)
Nickel (Res. & I/C only) (inhalation only)
Nitrate as N
Nitrobenzene
Selenium
Simazine
Styrene (ingestion only)
1,3,5-Trinitrobenzene
Zinc

Decreased Body Weight Gain
Atrazine
Bis(2-chloroethyl)ether
Cyanide
1,2-Dichlorobenzene (inhalation only)
Diethyl phthalate (ingestion only)

Decreased Body Weight Gain (continued)
Ensosulfan
2-Methylphenol (o-cresol)
Naphthalene (ingestion only)
Nickel (ingestion only)
n-Nitrosodiphenylamine
Phenol (ingestion only)
Simazine
Tetrachloroethylene (ingestion only)
1,1,1-Trichloroethane (ingestion only)
Vinyl acetate (ingestion only)
Xylenes (Res. & I/C only) (ingestion only)

Endocrine System
Cyanide
1,2-Dibromoethane (ingestion only)
Di-n-octyl phthalate (ingestion only)
Nitrobenzene
1,2,4-Trichlorobenzene (ingestion only)

Eye
2,4-Dinitrophenol
n-Nitrosodiphenylamine
Polychlorinated biphenyls (PCBs)
Trichloroethylene

Gastrointestinal System
Beryllium (ingestion only)
Copper
1,3-Dichloropropene (cis + trans) (ingestion only)
Endothall
Fluoride
Hexachlorocyclopentadiene (ingestion only)
Iron
Methyl bromide (ingestion only)
Methyl tertiary-butyl ether (ingestion only)

Immune System
4-Chloroaniline
2,4-Dichlorophenol
Mercury (ingestion only)
Polychlorinated biphenyls (PCBs)

Kidney
Acetone (ingestion only)
Aldrin (CW only)
Barium
Bromodichloromethane (ingestion only)
Cadmium
2,4-D
Dalapon
1,1-Dichloroethane
1,2-Dichloroethane (CW only) (ingestion only)
Ensosulfan
Ethylbenzene (ingestion only)
Fluoranthene
gamma-HCH (gamma-BHC)
Hexachloroethane (ingestion only)
Isopropylbenzene
MCPP
Methyl tertiary-butyl ether (inhalation only)
Nitrobenzene
Pentachlorophenol
Pyrene
Toluene (ingestion only)
2,4,5-Trichlorophenol
Vinyl acetate (ingestion only)

Liver
Acenaphthene
Aldrin (Res. & I/C only)
Bis(2-ethylhexyl)phthalate (Res.& I/C only) (ingestion only)
Bromoform
Butyl Benzyl Phthalate (ingestion only)
Carbon Tetrachloride
Chlordane

Liver (continued)
Chlorobenzene (ingestion only)
Chlorodibromomethane (ingestion only)
Chloroform
2,4-D
DDT
1,2-Dibromoethane (ingestion only)
1,2-Dichlorobenzene (CW only) (ingestion only)
1,4-Dichlorobenzene
Dichlorodifluoromethane
1,2-Dichloroethane (inhalation only)
1,1-Dichloroethylene
trans-1,2-Dichloroethylene
1,2-Dichloropropane (ingestion only)
Dieldrin (Res. & I/C only)
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate (ingestion only)
p-Dioxane
Endrin
Ethylbenzene (ingestion only)
Fluoranthene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
alpha-HCH (alpha-BHC)
gamma-HCH (gamma-BHC)
HMX
Isophorone (inhalation only)
Methyl tertiary-butyl ether
Methylene Chloride (ingestion only)
Nitrobenzene
Pentachlorophenol
Phenol (inhalation only)

Picloram
Styrene (ingestion only)
Tetrachloroethylene (ingestion only)
Toxaphene (CW only)
2,4,5-TP (Silvex)

Liver (continued)
1,2,4-Trichlorobenzene (inhalation only)
1,1,1-Trichloroethane (inhalation only)
1,1,2-Trichloroethane (ingestion only)
2,4,5-Trichlorophenol
2,4,6-Trinitrotoluene
Vinyl Chloride

Mortality
Di-n-butyl phthalate (ingestion only)
Xylenes (Res. & I/C only) (ingestion only)

Nervous System
Butanol (ingestion only)
Carbon disulfide (inhalation only)
Cyanide
Dieldrin (CW only)
2,4-Dimethylphenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Endrin
Hexachloroethane (inhalation only) (CW only)
Manganese
Mercury (inhalation only)
2-Methylphenol (o-cresol)
Phenol (inhalation only)
Selenium
Styrene (inhalation only)
Tetrachloroethylene (inhalation only)
Toluene (inhalation only)
Trichloroethylene
Xylenes (CW only) (ingestion only)
Xylenes (inhalation only)

Reproductive System
Arsenic (inhalation only)
Bis(2-ethylhexyl)phthalate (CW only) (ingestion only)
Boron
2-Butanone

Reproductive System (continued)
Carbofuran
Carbon disulfide (ingestion only)
2-Chlorophenol
1,2-Dibromo-3-chloropropane
1,2-Dibromoethane (ingestion only)
Dicamba
Dinoseb
Ethylbenzene (inhalation only)
Isophorone (inhalation only)

Reproductive System (continued)
Methoxychlor
RDX
2,4,6-Trichlorophenol

Respiratory System
Antimony (inhalation only)
Benzoic Acid (inhalation only)
Beryllium (inhalation only)
Cadmium (inhalation only)
Chromium (hex) (inhalation only)
Cobalt (inhalation only)
1,2-Dibromoethane (inhalation only)
trans-1,2-Dichloroethylene (inhalation only)
1,2-Dichloropropane (inhalation only)
1,3-Dichloropropene (cis + trans)(inhalation only)
Hexachlorocyclopentadiene (inhalation only)
Methyl bromide (inhalation only)
Naphthalene (inhalation only)
Nickel (inhalation only)
Vinyl acetate (inhalation only)

Skin
Arsenic (ingestion only)
Polychlorinated biphenyls (PCBs)

Selenium
Silver

Spleen
1,3-Dinotrobenzene
1,3,5-Trinitrobenzene

Notes:
Res. = Residential receptor
I/C = Industrial Commercial receptor
CW = Construction Worker receptor

(Source: Amended at ____ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX A: General

Section 742.TABLE F: Similar-Acting Carcinogenic Chemicals

~~Kidney~~
~~Bromodichloromethane (Ingestion only)~~
~~Chloroform (Ingestion only)~~
~~1,2-Dibromo-3-chloropropane (Ingestion only)~~
~~2,4-Dinitrotoluene~~
~~2,6-Dinitrotoluene~~
~~Hexachlorobenzene~~

~~Liver~~
~~Aldrin~~
~~Bis(2-chloroethyl)ether~~
~~Bis(2-ethylhexyl)phthalate (Ingestion only)~~
~~Carbazole~~
~~Carbon tetrachloride~~
~~Chlordane~~
~~Chloroform (Inhalation only)~~
~~DDD~~
~~DDE~~
~~DDT~~
~~1,2-Dibromo-3-chloropropane (Ingestion only)~~
~~1,2-Dibromoethane(Ingestion only)~~
~~3,3' Dichlorobenzidine~~
~~1,2-Dichloroethane~~
~~1,2-Dichloropropane (Ingestion only)~~
~~1,3-Dichloropropylene (Ingestion only)~~
~~Dieldrin~~
~~2,4-Dinitrotoluene~~
~~2,6-Dinitrotoluene~~
~~Heptachlor~~
~~Heptachlor epoxide~~
~~Hexachlorobenzene~~
~~alpha-HCH~~
~~gamma-HCH (Lindane)~~
~~Methylene chloride~~
~~N-Nitrosodiphenylamine~~
~~N-Nitrosodi-n-propylamine~~
~~Pentachlorophenol~~

~~Tetrachloroethylene~~
~~Trichloroethylene~~
~~2,4,6-Trichlorophenol~~
~~Toxaphene~~
~~Vinyl chloride~~

~~Circulatory System~~
~~Benzene~~
~~2,4,6-Trichlorophenol~~

~~Gastrointestinal System~~
~~Benzo(a)anthracene~~
~~Benzo(b)fluoranthene~~
~~Benzo(k)fluoranthene~~
~~Benzo(a)pyrene~~
~~Chrysene~~
~~Dibenzo(a,h)anthracene~~
~~Indeno(1,2,3-c,d)pyrene~~
~~Bromodichloromethane (Ingestion only)~~
~~Bromoform~~
~~1,2-Dibromo-3-chloropropane (Ingestion only)~~
~~1,2-Dibromoethane (Ingestion only)~~
~~1,3-Dichloropropylene (Ingestion only)~~

~~Lung~~
~~Arsenic (Inhalation only)~~
~~Beryllium (Inhalation only)~~
~~Cadmium (Inhalation only)~~
~~Chromium, hexavalent (Inhalation only)~~
~~1,3-Dichloropropylene (Inhalation only)~~
~~Methylene chloride (Inhalation only)~~
~~N-Nitrosodi-n-propylamine~~
~~Nickel (Inhalation only)~~
~~Vinyl chloride~~

~~Nasal Cavity~~
~~1,2-Dibromo-3-chloropropane (Inhalation only)~~
~~1,2-Dibromoethane (Inhalation only)~~
~~N-Nitrosodi-n-propylamine~~

~~Bladder~~
~~3,30-Dichlorobenzidine~~
~~1,3-Dichloropropylene (Ingestion only)~~
~~N-Nitrosodiphenylamine~~

Bladder
1,3-Dichloropropene (cis + trans) (ingestion only)
n-Nitrosodiphenylamine

Circulatory System
Benzene
1,2-Dibromoethane
1,2-Dichloroethane
Pentachlorophenol
2,4,6-Trichlorophenol

Gall Bladder
p-Dioxane (inhalation only)

Gastrointestinal System
Benzo(a)anthracene (ingestion only)
Benzo(b)fluoranthene (ingestion only)
Benzo(k)flouranthene (ingestion only)
Benzo(a)pyrene (ingestion only)
Bromoform
Chrysene (ingestion only)
Dibenzo(a,h)anthracene (ingestion only)
1,2-Dibromoethane (ingestion only)
Indeno(1,2,3-cd)pyrene (ingestion only)

Kidney
Bromodichloromethane (ingestion only)
Chloroform (ingestion only)
1,2-Dibromo-3-chloropropane (ingestion only)

Liver
Aldrin
Bis(2-chloroethyl)ether
Bis(2-ethylhexyl)phthalate
Carbazole
Carbon Tetrachloride
Chlordane

Liver (continued)
Chloroform
DDD
DDE
DDT
1,2-Dichloropropane
Dieldrin
2,4-Dinitrotoluene
2,6-Dinitrotoluene
p-Dioxane
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
alpha-HCH (alpha-BHC)
gamma-HCH (gamma-BHC)
Methylene Chloride
n-Nitrosodiphenylamine (inhalation only)
n-Nitrosodi-n-propylamine
Pentachlorophenol
Polychlorinated biphenyls (PCBs)
Tetrachloroethylene
Toxaphene
Trichloroethylene
Vinyl Chloride (I/C & CW)
Vinyl Chloride (Res.)

Mammary Gland
3,3'-Dichlorobenzidine
2,4-Dinitrotoluene
2,6-Dinitrotoluene

Respiratory System
Arsenic (inhalation only)
Benzo(a)anthracene (inhalation only)
Benzo(b)fluoranthene (inhalation only)
Benzo(k)flouranthene (inhalation only)
Benzo(a)pyrene (inhalation only)

Respiratory System (continued)
Beryllium
Cadmium
Chromium (hexavalent ion)
Chrysene (inhalation only)
Cobalt
Dibenzo(a,h)anthracene (inhalation only)
1,2-Dibromo-3-chloropropane (inhalation only)
1,2-Dibromoethane (inhalation only)
p-Dioxane (inhalation only)
Trichloroethylene

Notes:
Res. = Residential receptor
I/C = Industrial Commercial receptor
CW = Construction Worker receptor

(Source: Amended at ____ Ill. Reg. _____, effective _____)

Section 742.APPENDIX A General

Section 742.TABLE I Chemicals Whose Tier 1 Class I Groundwater Remediation Objective Exceeds the 1 in 1,000,000 Cancer Risk Concentration

Chemical	**Class I Groundwater Remediation Objective (mg/L)**	**1 in 1,000,000 Cancer Risk Concentration (mg/L)**	**ADL (mg/L)**
Aldrin	0.014	0.000005	0.014
Benzo(a)anthracene	0.00013	0.00012	0.00013
Benzo(a)pyrene	0.0002	0.000012	0.00023
Benzo(b)fluoranthene	0.00018	0.00012	0.00018
Bis(2-chloroethyl)ether	0.01	0.000077	0.01
Bis(2-ethylhexyl)phthalate (Di(2-ethylhexyl)phthalate)	0.006	0.0061	0.0027
Carbazole	0.0043	0.0043	NA
Carbon Tetrachloride	0.005	0.00066	0.0001
Chlordane	0.002	0.000066	~~0.00014~~ NA
DDD	0.014	0.00023	0.014
DDE	0.01	0.00023	0.01
DDT	0.006	0.00023	0.006
Dibenzo(a,h)anthracene	0.0003	0.000012	0.0003
1,2-Dibromo-3-chloropropane	0.0002	0.000061	0.001
1,2-Dibromoethane	0.00005	0.00002	0.001
3,3'-Dichlorobenzidine	0.02	0.00019	0.02
1,2-Dichloroethane	0.005	0.00094	0.0003
1,2-Dichloropropane	0.005	0.0024	0.00006
1,3-Dichloropropene	0.001	0.00085	0.001
Dieldrin	0.009	0.0000053	0.009
2,6-Dinitrotoluene	0.00031	0.0001	0.00031
Heptachlor	0.0004	0.000019	0.013
Heptachlor epoxide	0.0002	0.0000094	0.015
Hexachlorobenzene	0.00006	0.000053	0.00006
Alpha-HCH	0.00011	0.000014	0.000111
Gamma-HCH (gamma-BHC)	0.0002	0.000066	0.014
Tetrachloroethylene	0.005	0.0016	0.0004
Toxaphene	0.003	0.000077	~~0.00086~~ NA
Vinyl chloride (Non-residential)	0.002	0.00012	0.0002
Vinyl chloride (Residential)	0.002	~~0.000045~~ 0.000057	0.0002
Ionizable Organics			
N-Nitrosodi-n-propylamine	0.0018	0.000012	0.0018
Pentachlorophenol	0.001	0.00071	0.000076
2,4,6-Trichlorophenol	0.01	0.007	0.01
Inorganics			
Arsenic	~~0.05~~ 0.10	0.000057	0.001

(Source: Appendix A, Table I renumbered from Appendix A, Table H and amended at ____ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX A: General

Section 742.Table J: List of TACO Volatile Chemicals for the Indoor Inhalation Exposure Route

CAS No.	Chemical
67-64-1	Acetone
71-43-2	Benzene
111-44-4	Bis(2-chloroethyl)ether
75-27-4	Bromodichloromethane
75-25-2	Bromoform
71-36-3	Butanol
78-93-3	2-Butanone (MEK)
75-15-0	Carbon disulfide
56-23-5	Carbon tetrachloride
108-90-7	Chlorobenzene
124-48-1	Chlorodibromomethane
67-66-3	Chloroform
95-57-8	2-Chlorophenol
75-99-0	Dalapon
96-12-8	1,2-dibromo-3-chloropropane
106-93-4	1,2-Dibromoethane
95-50-1	1,2-Dichlorobenzene
106-46-7	1,4-Dichlorobenzene
75-71-8	Dichlorodifluoromethane
75-34-3	1,1-Dichloroethane
107-06-2	1,2-Dichloroethane
75-35-4	1,1-Dichloroethylene
156-59-2	cis-1,2-Dichloroethylene
156-60-5	Trans-1,2-Dichloroethylene
78-87-5	1,2-Dichloropropane
542-75-6	1,3-Dichloropropylene (cis + trans)
123-91-1	p-Dioxane
100-41-4	Ethylbenzene
76-44-8	Heptachlor
118-74-1	Hexachlorobenzene
77-47-4	Hexachlorocyclopentadiene
67-72-1	Hexachloroethane
78-59-1	Isophorone

CAS No.	Chemical
98-82-8	Isopropylbenzene (Cumene)
7439-97-6	Mercury
74-83-9	Methyl bromide
1634-04-4	Methyl tertiary-butyl ether
75-09-2	Methylene chloride
93-65-2	2-Methylnaphthalene
95-48-7	2-Methylphenol (o-cresol)
91-20-3	Naphthalene
98-95-3	Nitrobenzene
621-64-7	n-Nitrosodi-n-propylamine
108-95-2	Phenol
1336-36-3	Polychlorinated biphenyls (PCBs)
100-42-5	Styrene
127-18-4	Tetrachloroethylene
108-88-3	Toluene
120-82-1	1,2,4-Trichlorobenzene
71-55-6	1,1,1-Trichloroethane
79-00-5	1,1,2-Trichloroethane
79-01-6	Trichloroethylene
75-69-4	Trichlorofluoromethane
108-05-4	Vinyl acetate
75-01-4	Vinyl chloride
108-38-3	m-Xylene
95-47-6	o-Xylene
106-42-3	p-Xylene
1330-20-7	Xylenes (total)

(Source: Added at ____ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742. APPENDIX A: Tier 1 Illustrations and Tables

Section 742. TABLE K: Soil Vapor Saturation Limits (C_v^{sat}) for Volatile Chemicals

CAS No.	Chemical Name	C_v^{sat} (mg/m^3)
67-64-1	Acetone	7.50E+05
71-43-2	Benzene	4.20E+05
111-44-4	Bis(2-chloroethyl)ether	1.20E+04
75-27-4	Bromodichloromethane	4.50E+05
75-25-2	Bromoform	7.80E+04
71-36-3	Butanol	2.90E+04
78-93-3	2-Butanone (MEK)	3.80E+05
75-15-0	Carbon disulfide	1.50E+06
56-23-5	Carbon tetrachloride	1.00E+06
108-90-7	Chlorobenzene	7.40E+04
124-48-1	Chlorodibromomethane	5.70E+04
67-66-3	Chloroform	1.30E+06
95-57-8	2-Chlorophenol (ionizable organic)	1.70E+04
75-99-0	Dalapon	1.50E+03
96-12-8	1,2-Dibromo-3-chloropropane	7.80E+03
106-93-4	1,2-Dibromoethane	1.40E+05
95-50-1	1,2-Dichlorobenzene	1.10E+04
106-46-7	1,4-Dichlorobenzene	8.40E+03
75-71-8	Dichlorodifluoromethane	3.30E+07
75-34-3	1,1-Dichloroethane	1.30E+06
107-06-2	1,2-Dichloroethane	4.40E+05
75-35-4	1,1-Dichloroethylene	3.30E+06

CAS No.	Chemical Name	C_v^{sat} (mg/m^3)
156-59-2	cis-1,2-Dichloroethylene	1.10E+06
156-60-5	trans-1,2-Dichloroethylene	1.80E+06
78-87-5	1,2-Dichloropropane	3.20E+05
542-75-6	1,3-Dichloropropylene (cis + trans)	2.10E+05
123-91-1	p-Dioxane	1.90E+05
100-41-4	Ethylbenzene	5.90E+04
76-44-8	Heptachlor	8.30E+00
118-74-1	Hexachlorobenzene	2.80E-01
77-47-4	Hexachlorocyclopentadiene	9.10E+02
67-72-1	Hexachloroethane	2.80E+03
78-59-1	Isophorone	3.40E+03
98-82-8	Isopropylbenzene (Cumene)	3.00E+04
7439-97-6	Mercury (elemental)	2.20E+01
74-83-9	Methyl bromide	8.60E+06
1634-04-4	Methyl tertiary-butyl ether	1.20E+06
75-09-2	Methylene chloride	2.00E+06
93-65-2	2-Methylnaphthalene	5.30E+02
1634-04-4	2-Methylphenol (o-cresol)	1.80E+03
91-20-3	Naphthalene	6.20E+02
98-95-3	Nitrobenzene	1.70E+03
621-64-7	n-Nitrosodi-n-propylamine	9.50E+02
108-95-2	Phenol	1.50E+03
1336-36-3	Polychlorinated biphenyls (PCBs)	9.00E+00
100-42-5	Styrene	3.40E+04

CAS No.	Chemical Name	C_v^{sat} (mg/m^3)
127-18-4	Tetrachloroethylene	1.80E+05
108-88-3	Toluene	1.40E+05
120-82-1	1,2,4-Trichlorobenzene	4.30E+03
71-55-6	1,1,1-Trichloroethane	8.70E+05
79-00-5	1,1,2-Trichloroethane	1.70E+05
79-01-6	Trichloroethylene	5.30E+05
75-69-4	Trichlorofluoromethane	6.30E+06
108-05-4	Vinyl acetate	4.30E+05
75-01-4	Vinyl chloride	1.10E+07
108-38-3	m-Xylene	5.20E+04
95-47-6	o-Xylene	4.10E+04
106-42-3	p-Xylene	5.50E+04
1330-20-7	Xylenes (total)	4.90E+04

(Source: Added at ____ Ill. Reg. _____, effective _____)

Section 742. APPENDIX A: Tier 1 Illustrations and Tables

Section 742. TABLE L: Soil Saturation Limits (C_{sat}) for Volatile Chemicals for the Indoor Inhalation Exposure Route[a]

CAS No.	Chemical Name	C_{sat}(mg/kg)
67-64-1	Acetone	1.00E+05
71-43-2	Benzene	4.00E+02
111-44-4	Bis(2-chloroethyl)ether	2.20E+03
75-27-4	Bromodichloromethane	1.40E+03
75-25-2	Bromoform	8.80E+02
71-36-3	Butanol	8.30E+03
75-15-0	Carbon disulfide	4.50E+02
78-93-3	2-Butanone (MEK)	2.30E+04
56-23-5	Carbon tetrachloride	5.00E+02
108-90-7	Chlorobenzene	2.40E+02
124-48-1	Chlorodibromomethane	6.30E+02
67-66-3	Chloroform	1.70E+03
95-57-8	2-Chlorophenol (ionizable organic)	4.90E+04
75-99-0	Dalapon	9.90E+04[b]
96-12-8	1,2-Dibromo-3-chloropropane	3.10E+02[b]
106-93-4	1,2-Dibromoethane	8.10E+02
95-50-1	1,2-Dichlorobenzene	2.00E+02
106-46-7	1,4-Dichlorobenzene	1.30E+02
75-71-8	Dichlorodifluoromethane	4.90E+02
75-34-3	1,1-Dichloroethane	9.70E+02
107-06-2	1,2-Dichloroethane	1.20E+03

CAS No.	Chemical Name	C_{sat}(mg/kg)
75-35-4	1,1-Dichloroethylene	7.60E+02
156-59-2	cis-1,2-Dichloroethylene	7.00E+02
156-60-5	trans-1,2-Dichloroethylene	1.60E+03
78-87-5	1,2-Dichloropropane	5.90E+02
542-75-6	1,3-Dichloropropylene (cis + trans)	6.00E+02
123-91-1	p-Dioxane	1.00E+05
100-41-4	Ethylbenzene	1.30E+02
76-44-8	Heptachlor	1.10E+00
118-74-1	Hexachlorobenzene	2.50E-01
77-47-4	Hexachlorocyclopentadiene	4.40E+01
67-72-1	Hexachloroethane	1.60E+02
78-59-1	Isophorone	1.80E+03
98-82-8	Isopropylbenzene (Cumene)	3.70E+02
7439-97-6	Mercury (elemental)	4.50E-01
74-83-9	Methyl bromide	2.30E+03
1634-04-4	Methyl tertiary-butyl ether	6.30E+03
75-09-2	Methylene chloride	1.80E+03
93-65-2	2-Methylnaphthalene	8.20E+01
1634-04-4	2-Methylphenol (o-cresol)	4.80E+03
91-20-3	Naphthalene	3.40E+01
98-95-3	Nitrobenzene	3.80E+02
621-64-7	n-Nitrosodi-n-propylamine	1.30E+03
108-95-2	Phenol	1.20E+04
1336-36-3	Polychlorinated biphenyls (PCBs)	NA

CAS No.	Chemical Name	C_{sat}(mg/kg)
100-42-5	Styrene	2.30E+02
127-18-4	Tetrachloroethylene	2.90E+02
108-88-3	Toluene	2.40E+02
120-82-1	1,2,4-Trichlorobenzene	9.80E+02
71-55-6	1,1,1-Trichloroethane	5.60E+02
79-00-5	1,1,2-Trichloroethane	9.00E+02
79-01-6	Trichloroethylene	5.20E+02
75-69-4	Trichlorofluoromethane	9.50E+02
108-05-4	Vinyl acetate	2.20E+03
75-01-4	Vinyl chloride	2.5E+03
108-38-3	m-Xylene	1.50E+00
95-47-6	o-Xylene	1.40E+02
106-42-3	p-Xylene	1.20E+02
1330-20-7	Xylenes (total)	1.00E+02[b]

[a] The Soil Saturation Limit was calculated using an foc of 0.002 g/g and a system temperature of 13°C.
[b] The Soil Saturation Limit calculated at 25° C.

(Source: Added at ____ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX B Tier 1 Illustrations and Tables

Section 742.TABLE A Tier 1 Soil Remediation Objectives[a] for Residential Properties[a,f]

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
83-32-9	Acenaphthene	4,700[b]	---[c]	~~570~~[b] 110[r]	~~2,900~~ 540[r]	*
67-64-1	Acetone	70,000[b]	100,000[d]	25[b,r]	25[r]	*
15972-60-8	Alachlor[o]	8[e]	---[c]	~~0.04~~ 0.26[r]	~~0.2~~ 1.3[r]	NA
116-06-3	Aldicarb[o]	78[b]	---[c]	~~0.013~~ 0.014[r]	~~0.07~~ 0.068[r]	NA
309-00-2	Aldrin	~~0.04~~ 0.038[e]	~~3~~ 0.9[e]	~~0.5~~ 0.05[e]	~~2.5~~ 0.25	0.94
120-12-7	Anthracene	~~23,000~~ 24,000[b]	---[c]	~~12,000~~[b] 2,100[r]	~~59,000~~ 11,000[r]	*
1912-24-9	Atrazine[o]	2,700[b]	---[c]	~~0.066~~ 0.056[r]	~~0.33~~ 0.28[r]	NA
71-43-2	Benzene	12[e]	0.8[e]	~~0.03~~ 0.032[r]	~~0.17~~ 0.16[r]	*
56-55-3	Benzo(*a*)anthracene	~~0.9~~ 0.88[e,w]	~~—~~[e] 210[e]	~~2~~ 2.1[r]	~~8~~ 10[r]	*
205-99-2	Benzo(*b*)fluoranthene	~~0.9~~ 0.88[e,w]	~~—~~[c] 96[e]	~~5~~ 7.5[r]	~~25~~ 38[r]	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
207-08-9	Benzo(*k*)fluroanthene	~~9~~ 8.8[e]	~~—~~[e] 780[e]	~~49~~ 48[r]	~~250~~ 240[r]	*
50-32-8	Benzo(*a*)pyrene	~~0.09~~ 0.088[e,w]	~~—~~[e] 48[e]	~~8~~ 6.3[r]	~~82~~ 63[r]	*
111-44-4	Bis(2-chloroethyl)ether	~~0.6~~ 0.58[e]	~~0.2~~ 0.3[e]	~~0.0004~~ 0.00036[e]	~~0.0004~~ 0.00036	0.66
117-81-7	Bis(2-ethylhexyl)phthalate	46[e]	~~31,000~~ 200[d]	~~3,600~~ 24[r]	~~31,000~~ 68[d]	*
75-27-4	Bromodichloromethane (Dichlorobromomethane)	10[e]	~~3,000~~ 2,800[d]	~~0.6~~ 0.61[z]	~~0.6~~ 0.61	*
75-25-2	Bromoform	81[e]	~~53~~ 54[e]	~~0.8~~ 0.77[z]	~~0.8~~ 0.77[z]	*
71-36-3	Butanol	7,800[b]	10,000[d]	17[b]	17	NA
78-93-3	2-Butanone (MEK)	47,000[b]	13,000[b]	17[r]	17[r]	*
85-68-7	Butyl benzyl phthalate	16,000[b]	~~930~~ 1,000[d]	~~930~~ 340[d]	~~930~~ 340[d]	*
86-74-8	Carbazole	32[e]	---[c]	~~0.6~~ 0.66[e]	~~2.8~~ 3.3	NA
1563-66-2	Carbofuran[o]	390[b]	---[c]	~~0.22~~ 0.47[r]	~~1.1~~ 2.3[r]	NA
75-15-0	Carbon disulfide	7,800[b]	~~720~~ 850[d,x]	~~32[b]~~ 6.1[r]	~~160~~ 30[r]	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
56-23-5	Carbon tetrachloride	~~5~~ 4.9[e]	~~0.3~~ 0.36[e]	~~0.07~~ 0.071[r]	~~0.33~~ 0.35[r]	*
57-74-9	Chlordane	1.8[e]	~~72~~ 86[e,x]	~~10~~ 20[r]	~~48~~ 100[r]	*
106-47-8	4-Chloroaniline (*p*-Chloroaniline)	310[b]	---[c]	~~0.7~~ 0.65[b]	~~0.7~~[b] 0.65	*
108-90-7	Chlorobenzene (Monochlorobenzene)	1,600[b]	~~130~~ 320[b,x]	~~1~~ 1.2[r]	~~6.5~~ 6.1[r]	*
124-48-1	Chlorodibromomethane (Dibromochloromethane)	1,600[b]	~~1,300~~ 1,400[d]	~~0.4~~ 0.41[b]	~~0.4~~ 0.41	*
67-66-3	Chloroform	~~100~~ 21[e]	~~0.3~~ 0.31[e]	~~0.6~~ 0.44[r]	~~2.9~~ 2.2[r]	*
95-57-8	2-Chlorophenol	390[b]	~~53,000~~ 100,000[d]	~~4~~ 1.3[b,i]	~~4~~ 1.3[i]	*
218-01-9	Chrysene	88[e]	—[e] 610[e]	~~160~~ 190[r]	~~800~~ 960[r]	*
94-75-7	2,4-D[o]	780[b]	---[c]	~~1.5~~ 1.9[r]	~~7.7~~ 9.5[r]	*
75-99-0	Dalapon[o]	~~2,300~~ 2,400[b]	---[c]	~~0.85~~ 0.84[r]	~~8.5~~ 8.4[r]	*
72-54-8	DDD	~~3~~ 2.7[e]	---[c]	~~16~~ 13[e]	~~80~~ 63	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
72-55-9	DDE	~~2~~ 1.9[e]	---[c]	~~54~~ 4.8[e]	~~270~~ 24	*
50-29-3	DDT	~~2~~ 1.9[e]	~~—[g,x]~~ 560[e]	~~32~~ 24[e]	~~160~~ 120	*
53-70-3	Dibenzo(*a,h*)anthracene	~~0.09~~ 0.088[e,w]	~~—[e]~~ 170[e]	~~2~~ 30[r]	~~7.6~~ 150[r]	*
96-12-8	1,2-Dibromo-3-chloropropane	~~0.46~~ 0.8[e]	~~11[b]~~ 0.013[x,e]	~~0.002~~ 0.0014[r]	~~0.02~~ 0.014[r]	~~*~~ 0.005
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.32[e]	~~0.06~~ 0.04[e]	~~0.0004~~ 0.0003[r]	~~0.0004~~ 0.003[r]	0.005
84-74-2	Di-*n*-butyl phthalate	7,800[b]	~~2,300~~ 2,600[d]	~~2,300~~ 880[d]	~~2,300~~ 880[d]	*
1918-00-9	Dicamba	2,400[b]	---[c]	0.86[r]	0.86[r]	*
95-50-1	1,2-Dichlorobenzene (*o* – Dichlorobenzene)	7,000[b]	560[d,x]	~~17~~ 16[r]	~~43~~ 41[r]	*
106-46-7	1,4-Dichlorobenzene (*p* – Dichlorobenzene)	~~—[e]~~ 120[e]	~~11,000~~ 3.3[b,x,e]	~~2~~ 2.7[r]	~~11~~ 13[r]	*
91-94-1	3,3'-Dichlorobenzidine	~~1~~ 1.4[e]	~~—[e]~~ 18[e]	~~0.007~~ 0.023[e]	~~0.033~~ 0.12	1.3
75-71-8	Dichlorodifluoromethane	16,000[b]	200[b]	43[r]	220[r]	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
75-34-3	1,1-Dichloroethane	~~7,800~~ 16,000[b]	1,300[b,x]	~~23~~[b] 8[r]	~~110~~ 40[r]	*
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	7[e]	~~0.4~~ 0.38[e]	~~0.02~~ 0.024[r]	~~0.1~~ 0.12[r]	*
75-35-4	1,1-Dichloroethylene	3,900[b]	~~290~~ 280[b,x]	~~0.06~~ 0.055[r]	~~0.3~~ 0.28[r]	*
156-59-2	*cis*-1,2-Dichloroethylene	780[b]	~~1,200~~ 1,300[d]	~~0.4~~ 0.41[r]	~~1.1~~ 1.2[r]	*
156-60-5	*trans*-1,2-Dichloroethylene	1,600[b]	~~3,100~~ 140[d]	~~0.7~~ 0.67[r]	~~3.4~~ 3.3[r]	*
78-87-5	1,2-Dichloropropane	~~9~~ 18[e]	~~15~~ 0.94[~~b, c,~~ x]	~~0.03~~ 0.031[r]	0.15[r]	*
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	6.4[e]	~~1.1~~ 0.93[e,x]	~~0.004~~ 0.003[e]	~~0.02~~ 0.015	0.005
60-57-1	Dieldrin[n]	0.04[e]	1[e]	~~0.004~~ 0.005[e]	~~0.02~~ 0.025	0.603
84-66-2	Diethyl phthalate	63,000[b]	~~2,000~~ 2,200[d]	~~470[b]~~ 94[r]	~~470[b]~~ 94[r]	*
105-67-9	2,4-Dimethylphenol	1,600[b]	---[c]	~~9~~ 8.4[b]	~~9~~[b] 8.4[b]	*
75-71-8	1,3-Dinitrobenzene	7.8[b]	---[c]	0.0037[r]	0.0037[r]	0.25

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
121-14-2	2,4-Dinitrotoluene	~~0.9~~ 0.94[e]	---[c]	~~0.0008~~[e] 0.00076[r]	~~0.0008~~ 0.00076[r]	0.250
606-20-2	2,6-Dinitrotoluene	~~0.9~~ 0.94[e]	---[c]	~~0.0007~~[e] 0.0018[r]	~~0.0007~~[e] 0.0018[r]	0.26
117-84-0	Di-*n*-octyl phthalate	~~1,600~~ 3,100[b]	~~10,000~~ 16[d]	~~10,000~~ 5[d]	~~10,000~~ 5[d]	*
123-91-1	p-Dioxane	58[e]	8.2[e]	0.031[r]	0.031[r]	*
115-29-7	Endosulfan[o]	470[b]	---[c]	~~18~~ 41[b]	~~90~~ 200	*
145-73-3	Endothall[o]	1,600[b]	---[c]	~~0.4~~ 0.7[r]	~~0.4~~ 0.7[r]	NA
72-20-8	Endrin	~~23~~ 24[b]	---[c]	~~1~~ 2.6[r]	~~5~~ 13[r]	*
100-41-4	Ethylbenzene	7,800[b]	~~400~~ 350[d,x]	~~13~~ 12[r]	~~19~~ 17[r]	*
206-44-0	Fluoranthene	3,100[b]	---[c]	~~4,300~~[b] 830[r]	~~21,000~~ 4,100[r]	*
86-73-7	Fluorene	3,100[b]	---[c]	~~560~~[b] 150[r]	~~2,800~~ 730[r]	*
76-44-8	Heptachlor	~~0.1~~ 0.14[e]	~~0.1~~ 0.12[e]	~~23~~ 0.05[r]	~~110~~ 0.25[r]	0.871
1024-57-3	Heptachlor epoxide	0.07[e]	~~5~~ 5.9[e]	~~0.7~~ 1.6[r]	~~3.3~~ 8[r]	1.005
118-74-1	Hexachlorobenzene	0.4[e]	~~1~~ 0.59[e]	~~2~~ 0.8[z]	~~11~~ 4	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
319-84-6	*Alpha*-HCH (*alpha*-BHC)	0.1[e]	~~0.8~~ 1.3[e]	~~0.0005~~[e] 0.002[r]	~~0.003~~[e] 0.01[r]	0.0074
58-89-9	*Gamma*-HCH (Lindane)[n]	~~0.5~~ 0.49[e]	~~---~~[e,x] 4.5[e]	~~0.009~~ 0.025[r]	~~0.047~~ 0.12[r]	*
77-47-4	Hexachlorocyclopentadiene	~~550~~ 470[b]	~~10~~ 5.5[b,x]	~~400~~ 24[r]	~~2,200~~ 44[d]	*
67-72-1	Hexachloroethane	78[b]	---[c]	~~0.5~~ 0.45[b]	~~2.6~~ 2.2	*
2691-41-0	HMX	3,900[b]	---[c]	5.7[r]	5.7[r]	*
193-39-5	Indeno(1,2,3-*c,d*)pyrene	~~0.9~~ 0.88[e,w]	~~---~~[e] 1,100[e]	~~14~~ 53[r]	~~69~~ 270[r]	*
78-59-1	Isophorone	~~15,600~~ 16,000[b]	~~4,600~~ 3,000[d]	~~8~~ 7[b]	~~88~~ 7	*
98-82-8	Isopropylbenzene (Cumene)	7,800[b]	500[b]	91[r]	460[r]	*
72-43-5	Methoxychlor[o]	390[b]	~~---~~[e] 14[d]	~~160~~ 14[d]	~~780~~ 14[d]	*
74-83-9	Methyl bromide (Bromomethane)	110[b]	~~10~~ 9.6[b,x]	~~0.2~~ 0.24[b]	1.2	*
1634-04-4	Methyl tertiary-butyl ether	780[b]	~~8,800~~ 8,400[d,x]	~~0.32~~ 0.31[r]	~~0.32~~ 0.31[r]	*
75-09-2	Methylene chloride (Dichloromethane)	85[e]	13[e]	~~0.02~~[e] 0.023[r]	~~0.2~~ 0.23[r]	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
93-65-2	2-Methylnaphthalene	310[b]	---[c]	1.9[r]	9.5[r]	*
95-48-7	2-Methylphenol (*o* – Cresol)	3,900[b]	—[e] 94,000[b]	~~15~~[b] 2[r]	~~15~~ 2[r]	*
91-20-3	Naphthalene	1,600[b]	~~170~~ 89[b,x]	~~12~~[b] 3.4[r]	~~18~~ 5.3[r]	*
98-95-3	Nitrobenzene	39[b]	~~92~~ 77[b,x]	~~0.11~~[b] 0.02[r]	~~0.1~~ 0.02[r]	0.26
86-30-6	*N*-Nitrosodiphenylamine	130[e]	---[c]	~~1~~ 0.88[e]	~~5.6~~ 4.4	*
621-64-7	*N*-Nitrosodi-*n*-propylamine	~~0.09~~ 0.092[e]	—[e] 0.11[e]	~~0.00005~~ 0.000046[e]	~~0.00005~~ 0.000046	0.0018
108-95-2	Phenol	~~23,000~~ 24,000[b]	—[e] 34,000[b]	~~100~~[b] 0.48[r]	~~100~~ 0.48[r]	* 0.660
1918-02-1	Picloram[o]	5,500[b]	---[c]	2[r]	20[r]	NA
1336-36-3	Polychlorinated biphenyls (PCBs)[n]	1[h]	---[h]	---[h]	---[h]	*
129-00-0	Pyrene	~~2,300~~ 2,400[b]	---[c]	~~4,200~~[b] 530[r]	~~21,000~~ 2,700[r]	*
121-82-4	RDX	240[b]	---[c]	0.36[r]	0.36[r]	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
122-34-9	Simazine[o]	390[b]	---[c]	~~0.04~~ 0.037[r]	0.37[r]	NA
100-42-5	Styrene	16,000[b]	~~1,500~~ 630[d,x]	~~4~~ 1.7[r]	~~18~~ 8.4[r]	*
93-72-1	2,4,5-TP (Silvex)	630[b]	---[c]	11[i, r]	56[i, r]	*
127-18-4	Tetrachloroethylene (Perchloroethylene)	~~12~~ 1.2[e]	~~11~~ 2[e]	~~0.06~~ 0.15[r]	~~0.3~~ 0.76[r]	*
108-88-3	Toluene	~~16,000~~ 6,300[b]	~~650~~ 580[d,x]	~~12~~ 11[r]	~~29~~ 27[r]	*
8001-35-2	Toxaphene[n]	~~0.6~~ 0.58[e]	~~89~~ 30[e]	~~31~~ 6[r]	~~150~~ 30[r]	*
120-82-1	1,2,4-Trichlorobenzene	780[b]	~~3,200~~ 170 [b,x]	~~5~~ 4.7[r]	~~53~~ 47[r]	*
71-55-6	1,1,1-Trichloroethane	—[e] 160,000[b]	~~1,200~~ 1,300[d]	2[r]	~~9.6~~ 10[r]	*
79-00-5	1,1,2-Trichloroethane	310[b]	1,800[d]	~~0.02~~ 0.03[r]	0.3[r]	*
79-01-6	Trichloroethylene	~~58~~ 49[e]	~~5~~ 3.3[e]	~~0.06~~ 0.044[r]	~~0.3~~ 0.22[r]	*
75-69-4	Trichlorofluoromethane	24,000b	870b	34[r]	170[r]	*
99-35-4	1,3,5-Trinitrobenzene	2,400[b]	---[c]	3.9[r]	3.9[r]	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
118-96-7	2,4,6-Trinitrotoluene	39[b]	---[c]	0.077[r]	0.077r	0.25
108-05-4	Vinyl acetate	78,000[b]	~~1,000~~ 990[b,x]	170[b]	170	*
75-01-4	Vinyl chloride	~~0.46~~ 0.43[e]	0.28[e]	~~0.01~~ 0.013[r]	~~0.07~~ 0.066[r]	*
108-38-3	m-Xylene	16,000[b]	~~420~~ 410[d,x]	~~210~~ 200[r]	~~210~~ 200[r]	*
95-47-6	o-Xylene	16,000[b]	~~410~~ 370[d,x]	~~190~~ 170[r]	~~190~~ 170[r]	*
106-42-3	p-Xylene	16,000[b]	~~460~~ 330[d,x]	~~200~~ 170[r]	~~200~~ 170[r]	*
1330-20-7	Xylenes (total)	16,000[b]	~~320~~ 280[d,x]	~~150~~ 200[r]	~~150~~ 200[r]	*
	Ionizable Organics					
65-85-0	Benzoic Acid	310,000[b]	---[c]	~~400[b,i]~~ 110[i,r]	~~400~~ 110[i,r]	*
120-83-2	2,4-Dichlorophenol	~~230~~ 240[b]	---[c]	~~1~~ 3.3[b,i]	~~1~~ 3.3[i]	*
51-28-5	2,4-Dinitrophenol	160[b]	---[c]	~~0.2~~ 0.21[b]	~~0.2~~ 0.21	3.3
88-85-7	Dinoseb[o]	78[b]	---[c]	~~0.34[b]~~ 0.054[i,r]	~~3.4[i]~~ 0.54[i,r]	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
93-65-2	MCPP (mecorop)	78[b]	---[e]	0.033[r]	0.17[r]	0.066
87-86-5	Pentachlorophenol	~~3~~ 2.6[e,j]	---[c]	~~0.03~~ 0.11[i, r]	~~0.14~~ 0.57[i, r]	*
~~93-72-1~~	~~2,4,5-TP (Silvex)~~	~~630[b]~~	~~---[e]~~	~~11[i]~~	~~55[i]~~	~~*~~
95-95-4	2,4,5-Trichlorophenol	7,800[b]	---[c]	~~270~~ 440[b,i]	~~1,400~~ 2,200[i]	*
88-06-2	2,4,6 Trichlorophenol	58[e]	~~200~~ 430[e]	~~0.2~~ 0.31[e,i]	~~0.77~~ 1.6[i]	0.66
	Inorganics					
7440-36-0	Antimony	31[b]	---[c]	0.006[m, r]	0.024[m, r]	*
7440-38-2	Arsenic[l,n]	---[t]	~~750~~ 740[e]	0.05[m, r]	0.2[m, r]	*
7440-39-3	Barium	~~5,500~~ 16,000[b]	~~690,000[b]~~ ---[c]	2.0[m, r]	2.0[m, r]	*
7440-41-7	Beryllium	160[b]	1,300[e]	0.004[m, r]	0.5[m, r]	*
7440-42-8	Boron	16,000[b]	---[c]	2.0[m, r]	2.0[m, r]	*
7440-43-9	Cadmium[l,n]	78[b,r]	1,800[e]	0.005[m, r]	0.05[m, r]	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
7440-70-2	Calcium[n]	---[g]	---[c]	---[c]	---[c]	*
16887-00-6	Chloride	---[c]	---[c]	200[m,r]	200[m,r]	*
7440-47-3	Chromium, total	230[b,y]	270[e,y]	0.1[m,r]	1.0[m,r]	*
16065-83-1	Chromium, ion, trivalent	120,000[b]	---[c]	---[g]	---[g]	*
18540-29-9	Chromium, ion, hexavalent	230[b]	270[e]	---	---	*
7440-48-4	Cobalt	~~4,700~~ 1,600[b]	~~—~~[e] 1,100[e]	1.0[m,r]	1.0[m,r]	*
7440-50-8	Copper[n]	~~2,900~~ 3,100[b]	---[c]	0.65[m,r]	0.65[m,r]	*
57-12-5	Cyanide (amenable)	1,600[b]	---[c]	0.2[q,m,r]	0.6[q,m,r]	*
7782-41-4	Fluoride	4,700[b]	---[c]	4.0[m,r]	4.0[m,r]	*
15438-31-0	Iron	~~—~~[e] 55,000[b]	---[c]	5.0[m,r]	5.0[m,r]	*
7439-92-1	Lead	400[k]	---[c]	0.0075[m,r]	0.1[m,r]	*
7439-95-4	Magnesium[n]	325,000	---[c]	---[c]	---[c]	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
7439-96-5	Manganese	1,600[b,v]	69,000[b,x]	0.15[m,r]	10.0[m,r]	*
7439-97-6	Mercury[l,n,s]	~~23~~ 24[b]	~~10~~[b] 3.1[d,x]	0.002[m,r]	0.01[m,r]	*
7440-02-0	Nickel[l]	1,600[b]	13,000[e]	0.1[m,r]	2.0[m,r]	*
14797-55-8	Nitrate as N[p]	~~130,000~~ 120,000[b]	---[c]	10.0[q,m,r]	100[q,r]	*
14797-73-0	Perchlorate	55[b]	---[c]	0.0049[m,r]	0.0049[m,r]	*
7723-14-0	Phosphorus[n]	---[g]	---[c]	---[c]	---[c]	*
7440-09-7	Potassium[n]	---[g]	---[c]	---[c]	---[c]	*
7782-49-2	Selenium[l,n]	390[b]	---[c]	0.05[m,r]	0.05[m,r]	*
7440-22-4	Silver	390[b]	---[c]	0.05[m,r]	---[c]	*
7440-23-5	Sodium[n]	---[g]	---[c]	---[c]	---[c]	*
14808-79-8	Sulfate	---[c]	---[c]	400[m,r]	400[m,r]	*
7440-28-0	Thallium	6.3[b,u]	---[c]	0.002[m,r]	0.02[m,r]	*

		Exposure Route-Specific Values for Soils		Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
7440-62-2	Vanadium	550[b]	---[c]	0.049[m, b]	0.1[m, r]	*
7440-66-6	Zinc[l]	~~23,000~~ 24,000[b]	---[c]	5.0[m, r]	10[m, r]	*

"*" indicates that the ADL is less than or equal to the specified remediation objective.
NA means not available; no PQL or EQL available in USEPA analytical methods.

Chemical Name and Soil Remediation Objective Notations

[a] Soil remediation objectives based on human health criteria only.
[b] Calculated values correspond to a target hazard quotient of 1.
[c] No toxicity criteria available for the route of exposure.
[d] ~~Soil saturation concentration ($C_{[sat]}$) = the concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) have been violated, and alternative modeling approaches are required.~~ Calculated Tier 1 remediation objective exceeds the C_{sat} value of the chemical in soil. Therefore, the C_{sat} of the chemical is shown.
[e] Calculated values correspond to a cancer risk level of 1 in 1,000,000.
[f] See Appendix B, Table G for soil and soil gas remediation objectives for residential properties for the indoor inhalation exposure route.
[g] Chemical-specific properties are such that this route is not of concern at any soil contaminant concentration.
[h] 40 CFR 761 contains applicability requirements and methodologies for the development of PCB remediation objectives. Requests for approval of a Tier 3 evaluation must address the applicability of 40 CFR 761.
[i] Soil remediation objective for pH of 6.8. If soil pH is other than 6.8, refer to Appendix B, Tables C and D of this Part.
[j] Ingestion soil remediation objective adjusted by a factor of 0.5 to account for dermal route.
[k] A preliminary remediation goal of 400 mg/kg has been set for lead based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive #9355.4-12.
[l] Potential for soil-plant-human exposure.
[m] The person conducting the remediation has the option to use: 1) TCLP or SPLP test results to compare with the remediation objectives listed in this Table; 2) where applicable, the total amount of contaminant in the soil sample results to compare with pH specific remediation objectives listed in Appendix B, Table C or D of this Part (see Section 742.510); or 3) the appropriate background value listed in Appendix A, Table G. If the person conducting the remediation wishes to calculate soil remediation objectives based on background concentrations, this should be done in accordance with Subpart D of this Part.
[n] The Agency reserves the right to evaluate the potential for remaining contaminant concentrations to pose significant threats to crops, livestock, or wildlife.
[o] For agrichemical facilities, remediation objectives for surficial soils which are based on field application rates may be more appropriate for currently registered pesticides. Consult the Agency for further information.
[p] For agrichemical facilities, soil remediation objectives based on site-specific background concentrations of Nitrate as N may be more appropriate. Such determinations shall be conducted in accordance with the procedures set forth in Subparts D and I of this Part.
[q] The TCLP extraction must be done using water at a pH of 7.0.
[r] ~~Value based on dietary Reference Dose~~. Value based on the Groundwater Quality Standard for this chemical pursuant to 35 Ill. Adm. Code 620.
[s] Value for Ingestion based on Reference Dose for Mercuric chloride (CAS No. 7487-94-7); value for Inhalation based on Reference Concentration for elemental Mercury (CAS No. 7439-97-6). Inhalation remediation objective only applies at sites where elemental mercury is a contaminant of concern.
[t] For the ingestion route for arsenic, see 742.Appendix A, Table G.
[u] Value based on Reference Dose for Thallium sulfate (CAS No. 7446-18-6).
[v] Value based on Reference Dose adjusted for dietary intake.
[w] For sites located in any populated area as defined in Section 742.200, Appendix A, Table H may be used.
[x] The remediation objectives for these chemicals must also include the construction worker inhalation objective in Appendix B, Table B.

[y] Values for total Chromium based on toxicity data for hexavalent Chromium.
[z] Values based on maximum contaminant level.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX B Tier 1 Illustrations and Tables

Section 742.Table B Tier 1 Soil Remediation Objectives[a] for Industrial/Commercial Properties[a,f,k]

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
83-32-9	Acenaphthene	120,000[b]	---[c]	120,000[b]	---[c]	~~570~~[b] 110[r]	~~2,900~~ 540[r]	*
67-64-1	Acetone	~~---~~[g] 1,000,000	100,000[d]	~~---~~[g] 610,000	100,000[d]	25[b r]	25[r]	*
15972-60-8	Alachlor[o]	72[e]	---[c]	1,600[e]	---[c]	~~0.04~~ 0.26[r]	~~0.2~~ 1.3[r]	NA
116-06-3	Aldicarb[o]	2,000[b]	---[c]	200[b]	---[c]	~~0.013~~ 0.014[r]	~~0.07~~ 0.068[r]	NA
309-00-2	Aldrin	~~0.3~~ 0.34[e]	~~6.6~~ 1.7[e]	~~6.1~~[b] 7.3[e]	~~9.3~~ 2.4[e]	~~0.5~~ 0.05[e]	~~2.5~~ 0.25	0.94
120-12-7	Anthracene	610,000[b]	---[c]	610,000[b]	---[c]	~~12,000~~[b] 2,100[r]	~~59,000~~ 11,000[r]	*
1912-24-9	Atrazine[o]	72,000[b]	---[c]	7,100[b]	---[c]	~~0.066~~ 0.056[r]	~~0.33~~ 0.28[r]	NA
71-43-2	Benzene	100[e]	~~1.6~~ 1.5[e]	2,300[e]	2.2[e]	~~0.03~~ 0.032[r]	~~0.17~~ 0.16[r]	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
56-55-3	Benzo(*a*)anthracene	~~8~~ 7.8[e]	—[e] 400[e]	170[e]	—[e] 560[e]	~~2~~ 2.1[r]	~~8~~ 10[r]	*
205-99-2	Benzo(*b*)fluoranthene	~~8~~ 7.8[e]	—[e] 180[e]	170[e]	—[e] 260[e]	~~5~~ 7.5[r]	~~25~~ 38[r]	*
207-08-9	Benzo(*k*)fluroanthene	78[e]	—[e] 1,500[e]	1,700[e]	—[e] 2,100[e]	~~49~~ 48[r]	~~250~~ 240[r]	*
50-32-8	Benzo(*a*)pyrene	~~0.8~~ 0.78[e,x,w]	—[e] 92[e]	17[e]	—[e] 130[e]	~~8~~ 6.3[r]	~~82~~ 63[r]	*
111-44-4	Bis(2-chloroethyl)ether	~~5~~ 5.2[e]	~~0.47~~ 0.58[e]	~~75~~ 110[e]	~~0.66~~ 0.81[e]	~~0.0004~~ 0.00036[e]	~~0.0004~~ 0.00036	0.66
117-81-7	Bis(2-ethylhexyl)phthalate	410[e]	~~31,000~~ 200[d]	~~4,100~~[b] 8,900[e]	~~31,000~~ 200[d]	~~3,600~~ 24[r]	~~31,000~~ 200[d]	*
75-27-4	Bromodichloromethane (Dichlorobromomethane)	92[e]	~~3,000~~ 2,800[d]	2,000[e]	~~3,000~~ 2,800[d]	~~0.6~~ 0.61[z]	~~0.6~~ 0.61	*
75-25-2	Bromoform	720[e]	100[e]	~~16,000~~ 6,100[e]	~~140~~ 150[e]	~~0.8~~ 0.77[z]	~~0.8~~ 0.77[z]	*
71-36-3	Butanol	200,000[b]	10,000[d]	200,000[b]	10,000[d]	17[b]	17	NA
78-93-3	2-Butanone (MEK)	1,000,000	21,000[b]	120,000[b]	140[b]	17[r]	17[r]	*
85-68-7	Butyl benzyl phthalate	410,000[b]	~~930~~ 1,000[d]	410,000[b]	~~930~~ 1,000[d]	~~930~~ 1,000[d]	~~930~~ 1,000[d]	*
86-74-8	Carbazole	290[e]	---[c]	6,200[e]	---[c]	~~0.6~~ 0.66[e]	~~2.8~~ 3.3	NA

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
1563-66-2	Carbofuran[o]	10,000[b]	---[c]	1,000[b]	---[c]	~~0.22~~ 0.47[r]	~~1.1~~ 2.3[r]	NA
75-15-0	Carbon disulfide	200,000[b]	~~720~~ 850[d]	20,000[b]	~~9.0~~ 28[b]	~~32[b]~~ 6.1[r]	~~160~~ 30[r]	*
56-23-5	Carbon tetrachloride	44[e]	~~0.64~~ 0.68[e]	~~410[b]~~ 960[e]	~~0.90~~ 0.96[e]	~~0.07~~ 0.071[r]	~~0.33~~ 0.35[r]	*
57-74-9	Chlordane	16[e]	~~140~~ 160[e]	~~100~~ 120[b]	~~22[b]~~ 230[e]	~~10~~ 20[r]	~~48~~ 100[r]	*
106-47-8	4 – Chloroaniline (*p*-Chloroaniline)	8,200[b]	---[c]	820[b]	---[c]	~~0.7~~ 0.65[b]	~~0.7~~ 0.65[b]	*
108-90-7	Chlorobenzene (Monochlorobenzene)	41,000[b]	~~210~~ 500[b]	~~4,100~~ 14,000[b]	~~1.3~~ 33[b]	~~1~~ 1.2[r]	~~6.5~~ 6.1[r]	*
124-48-1	Chlorodibromomethane (Dibromochloromethane)	41,000[b]	~~1,300~~ 1,400[d]	41,000[b]	~~1,300~~ 1,400[d]	~~0.4~~ 0.41[b]	~~0.4~~ 0.41	*
67-66-3	Chloroform	~~940~~ 180[e]	~~0.54~~ 0.58[e]	~~2,000~~ 2,000[b]	~~0.76~~ 0.82[e]	~~0.6~~ 0.44[r]	~~2.9~~ 2.2[r]	*
95-57-8	2-Chlorophenol	10,000[b]	~~53,000~~ 100,000[d]	10,000[b]	~~53,000~~ 100,000[d]	~~4~~ 1.3[b,i]	~~4~~ 1.3[i]	*
218-01-9	Chrysene	780[e]	—[e] 1,200[e]	17,000[e]	—[e] 1,600[e]	~~160~~ 190[r]	~~800~~ 960[r]	*
94-75-7	2,4-D[o]	20,000[b]	---[c]	2,000[b]	---[c]	~~1.5~~ 1.9[r]	~~7.7~~ 9.5[r]	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
75-99-0	Dalapon[o]	61,000[b]	---[e] 120,000[d]	6,100[b]	---[e] 120,000[d]	~~0.85~~ 0.84[r]	~~8.5~~ 8.4[r]	*
72-54-8	DDD	24[e]	---[c]	~~520~~ 360[e]	---[c]	~~16~~ 13[e]	~~80~~ 63	*
72-55-9	DDE	17[e]	---[c]	370[e]	---[c]	~~54~~ 4.8[e]	~~270~~ 24	*
50-29-3	DDT	17[e]	~~1,500~~ 1,100[e]	100[b]	~~2,100~~ 1,500[e]	~~32~~ 24[e]	~~160~~ 120	*
53-70-3	Dibenzo(*a,h*)anthracene	~~0.8~~ 0.78[e]	---[e] 320[e]	17[e]	---[e] 450[e]	~~2~~ 30[r]	~~7.6~~ 150[r]	*
96-12-8	1,2-Dibromo-3-chloropropane	4 7.2[e]	~~17~~ 0.025[b]	~~89~~ 160[e]	~~0.11~~ 0.035[b]	~~0.002~~ 0.0014[r]	~~0.02~~ 0.014[r]	~~*~~ 0.005
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	2.9[e]	~~0.12~~ 0.076[e]	62[e]	~~0.16~~ 0.11[e]	~~0.0004~~ 0.0003[r]	~~0.0004~~ 0.003[r]	0.005
84-74-2	Di-*n*-butyl phthalate	200,000[b]	~~2,300~~ 2,600[d]	200,000[b]	~~2,300~~ 2,600[d]	~~2,300[d]~~ 1,100[r]	~~2,300[d]~~ 5,600[r]	*
1918-00-9	Dicamba	61,000[b]	---[c]	6,100[b]	---[c]	0.86[r]	0.86[r]	*
95-50-1	1,2-Dichlorobenzene (*o* – Dichlorobenzene)	180,000[b]	560[d]	~~18,000~~ 120,000[b]	~~310~~ 300[b]	~~17~~ 16[r]	~~43~~ 41[r]	*
106-46-7	1,4-Dichlorobenzene (*p* – Dichlorobenzene)	---[e] 1,100[e]	~~17,000[b]~~ 6.2[e]	---[e] 14,000[b]	~~340[b]~~ 8.8[e]	~~2~~ 2.7[r]	~~11~~ 13[r]	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
91-94-1	3,3'-Dichlorobenzidine	13[e]	~~—~~[e] 34[e]	280[e]	~~—~~[e] 48[e]	~~0.007~~ 0.023[e]	~~0.033~~ 0.12	1.3
75-71-8	Dichlorodifluoromethane	410,000[b]	310[b]	180,000[b]	20[b]	43[r]	220[r]	*
75-34-3	1,1-Dichloroethane	~~200,000~~ 410,000[b]	1,700[d]	~~200,000~~ 410,000[b]	130[b]	~~23~~[b] 8r	~~110~~ 40[r]	*
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	63[e]	~~0.70~~ 0.73[e]	1,400[e]	~~0.99~~ 1[e]	~~0.02~~ 0.024[r]	~~0.1~~ 0.12[r]	*
75-35-4	1,1-Dichloroethylene	100,000[b]	~~470~~ 450[b]	10,000[b]	~~3.0~~ 2.9[b]	~~0.06~~ 0.055[r]	~~0.3~~ 0.28[r]	*
156-59-2	*cis*-1,2-Dichloroethylene	20,000[b]	~~1,200~~ 1,300[d]	20,000[b]	~~1,200~~ 1,300[d]	~~0.4~~ 0.41[r]	~~1.1~~ 1.2[r]	*
156-60-5	*Trans*-1,2-Dichloroethylene	41,000[b]	~~3,100~~[d] 230[b]	41,000[b]	~~3,100~~[d] 15[b]	~~0.7~~ 0.67[r]	~~3.4~~ 3.3[r]	*
78-87-5	1,2-Dichloropropane	~~84~~ 160[e]	~~23~~[b] 1.8[e]	~~1,800~~ 3,400[e]	~~0.50~~ 0.41[b]	~~0.03~~ 0.031[r]	0.15[r]	*
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	57[e]	~~2.1~~ 1.8[e]	1,200[e]	~~0.39~~ 0.66[b]	~~0.004~~ 0.003[e]	~~0.02~~ 0.015	0.005
60-57-1	Dieldrin[n]	~~0.4~~ 0.36[e]	~~2.2~~ 1.9[e]	7.8[e]	~~3.1~~ 2.7[e]	~~0.004~~ 0.005[e]	~~0.02~~ 0.025	0.603
84-66-2	Diethyl phthalate	1,000,000[b]	~~2,000~~ 2,200[d]	1,000,000[b]	~~2,000~~ 2,200[d]	~~470~~[b] 94[r]	~~470~~[b] 94[r]	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
105-67-9	2,4-Dimethylphenol	41,000[b]	~~—~~[e] 10,000[d]	41,000[b]	~~—~~[e] 10,000[d]	~~9~~ 8.4[b]	~~9~~[b] 8.4	*
75-71-8	1,3-Dinitrobenzene	200[b]	---[c]	200[b]	---[c]	0.0037[r]	0.0037[r]	0.25
121-14-2	2,4-Dinitrotoluene	8.4[e]	---[c]	180[e]	---[c]	~~0.0008~~[e] 0.00076[r]	~~0.0008~~ 0.00076[r]	0.25
606-20-2	2,6-Dinitrotoluene	8.4[e]	---[c]	180[e]	---[c]	~~0.0007~~[e] 0.0018[r]	~~0.0007~~[e] 0.0006[r]	0.26
117-84-0	Di-*n*-octyl phthalate	~~41,000~~[e] 82,000[d]	~~10,000~~ 16[d]	~~4,100~~ 82,000[b]	~~10,000~~ 16[d]	~~10,000~~ 5[d]	~~10,000~~ 5[d]	*
123-91-1	p-Dioxane	520[e]	16[e]	11,000[e]	22[e]	0.031[r]	0.031[r]	*
115-29-7	Endosulfan[o]	12,000[b]	---[c]	1,200[b]	---[c]	~~18~~ 41[b]	~~90~~ 200	*
145-73-3	Endothall[o]	41,000[e, b]	---[c]	4,100[b]	---[c]	~~0.4~~ 0.7[r]	~~0.4~~ 0.7[r]	NA
72-20-8	Endrin	610[b]	---[c]	61[b]	---[c]	~~1~~ 2.6[r]	~~5~~ 13[r]	*
100-41-4	Ethylbenzene	200,000[b]	~~400~~ 350[d]	20,000[b]	~~58~~ 55[b]	~~13~~ 12[r]	~~19~~ 17[r]	*
206-44-0	Fluoranthene	82,000[b]	---[c]	82,000[b]	---[c]	~~4,300~~[b] 830[r]	~~21,000~~ 4,100[r]	*
86-73-7	Fluorene	82,000[b]	---[c]	82,000[b]	---[c]	~~560~~[b] 150[r]	~~2,800~~ 730[r]	*
76-44-8	Heptachlor	~~1~~ 1.3[e]	~~11~~ 0.23[e]	28[e]	~~16~~ 0.32[e]	~~23~~ 0.05[r]	~~110~~ 0.25[r]	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
1024-57-3	Heptachlor epoxide	~~0.6~~ 0.63[e]	~~9.2~~ 11[e]	~~2.7~~ 2.6[b]	~~13~~ 16[e]	~~0.7~~ 1.6[r]	~~3.3~~ 8[r]	1.005
118-74-1	Hexachlorobenzene	~~4~~ 3.6[e]	~~1.8~~ 1.1[e]	78[e]	~~2.6~~ 1.6[e]	~~2~~ 0.8[z]	~~11~~ 4	*
319-84-6	*Alpha*-HCH (*alpha*-BHC)	~~0.9~~ 0.91[e]	~~1.5~~ 2.5[e]	20[e]	~~2.1~~ 3.5[e]	~~0.0005~~ 0.002[e]	~~0.003~~ 0.01	0.0074
58-89-9	*Gamma*-HCH (Lindane)[n]	~~4~~ 4.4[e]	~~—~~[e] 8.6[e]	96[e]	~~—~~[e] 12[e]	~~0.009~~ 0.025[r]	~~0.047~~ 0.12[r]	*
77-47-4	Hexachlorocyclopentadiene	~~14,000~~ 12,000[b]	~~16~~ 8.8[b]	~~14,000~~ 4,100[b]	~~1.1~~ 29[b]	~~400~~ 24[r]	~~2,200~~ 130[d]	*
67-72-1	Hexachloroethane	2,000[b]	~~---~~[c]	2,000[b]	~~—~~[e] 54,000[b]	~~0.5~~ 0.45[b]	~~2.6~~ 2.2	*
2691-41-0	HMX	100,000[b]	~~---~~[c]	100,000[b]	~~---~~[c]	5.7[r]	5.7[r]	*
193-39-5	Indeno(1,2,3-*c,d*)pyrene	~~8~~ 7.8[e]	~~—~~[e] 2,200[e]	170[e]	~~—~~[e] 3,000[e]	~~14~~ 53[r]	~~69~~ 270[r]	*
78-59-1	Isophorone	410,000[b]	~~4,600~~ 3,000[d]	410,000[b]	~~4,600~~[d] 1,400[b]	~~8~~ 7[b]	~~88~~ 7	*
98-82-8	Isopropylbenzene (Cumene)	200,000[b]	800[b]	82,00[b]	52[b]	~~160~~ 91[r]	~~780~~ 460[d]	*
72-43-5	Methoxychlor[o]	10,000[b]	~~—~~[e] 14[d]	1,000[b]	~~—~~[e] 14[d]	14[d]	14[d]	*
74-83-9	Methyl bromide (Bromomethane)	2,900[b]	15[b]	1,000[b]	~~3.9~~ 2[b]	~~0.2~~ 0.24[b]	1.2	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
1634-04-4	Methyl tertiary-butyl ether	20,000[b]	~~8,800~~ 8,400[d]	~~2,000~~ 20,000[b]	~~140~~ 160[b]	~~0.32~~ 0.31r	~~0.32~~ 0.31r	*
75-09-2	Methylene chloride (Dichloromethane)	760[e]	~~24~~ 25[e]	12,000[b]	~~34~~[e] 11[b]	~~0.02~~[e] 0.023[r]	~~0.2~~ 0.23r	*
93-65-2	2-Methylnaphthalene	8,200[b]	---[c]	820[b]	---[c]	1.9[r]	9.5[r]	*
95-48-7	2-Methylphenol (*o* – Cresol)	100,000[b]	—[e] 150,000[b]	100,000[b]	—[e] 2,900	~~15~~[b] 2[r]	~~15~~ 2[r]	*
86-30-6	*N*-Nitrosodiphenylamine	1,200[e]	---[c]	~~25,000~~ 4,100[e]	---[c]	~~1~~ 0.88[e]	~~5.6~~ 4.4	*
621-64-7	*N*-Nitrosodi-*n*-propylamine	~~0.8~~ 0.82[e]	—[e] 1,900[d]	18[e]	—[e] 1,900[d]	~~0.00005~~ 0.000046[e]	~~0.00005~~ 0.000046	0.0018
91-20-3	Naphthalene	41,000[b]	~~270~~ 140[b]	~~4,100~~ 41,000[b]	~~1.8~~ 0.92[b]	~~12~~[b] 3.4[r]	~~18~~ 5.3	*
98-95-3	Nitrobenzene	1,000[b]	~~140~~ 120[b]	1,000[b]	~~9.4~~ 7.9[b]	~~0.11~~[b] 0.02[r]	~~0.1~~ 0.02[r]	0.26
108-95-2	Phenol	610,000[b]	—[e] 54,000[b]	61,000[b]	—[e] 1,100[b]	~~100~~[b] 0.48[r]	~~100~~ 0.48[r]	~~*~~ 0.660
1918-02-1	Picloram[o]	140,000[b]	---[c]	14,000[b]	---[c]	2[r]	20[r]	NA
1336-36-3	Polychlorinated biphenyls (PCBs)[n]	1[h]	---[h]	1[h]	---[h]	---[h]	---[h]	*
129-00-0	Pyrene	61,000[b]	---[c]	61,000[b]	---[c]	~~4,200~~[b] 530[r]	~~21,000~~ 2,700[r]	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
121-82-4	RDX	6,100[b]	---[c]	610[b]	---[c]	0.36[r]	0.36[r]	*
122-34-9	Simazine[o]	10,000[b]	---[c]	1,000[b]	---[c]	~~0.04~~ 0.037[r]	0.37[r]	NA
100-42-5	Styrene	410,000[b]	1,500 630[d]	~~41,000~~ 410,000[b]	~~430~~ 280[b]	~~4~~ 1.7[r]	~~18~~ 8.4[r]	*
93-72-1	2,4,5-TP (Silvex)	16,000[b]	---[c]	160,000[b]	---[c]	11[i, r]	56[i, r]	*
127-18-4	Tetrachloroethylene (Perchloroethylene)	~~110~~ 11[e]	~~20~~ 3.8[e]	~~2,400~~ 230[e]	~~28~~ 5.3[e]	~~0.06~~ 0.15[r]	~~0.3~~ 0.76[r]	*
108-88-3	Toluene	~~410,000~~ 160,000[b]	~~650~~ 580[d]	~~410,000~~ 160,000[b]	~~42~~ 200[b]	~~12~~ 11[r]	~~29~~ 27[r]	*
8001-35-2	Toxaphene[n]	5.2[e]	~~170~~ 57[e]	110[e]	~~240~~ 80[e]	~~31~~ 6[r]	~~150~~ 30[r]	*
120-82-1	1,2,4-Trichlorobenzene	20,000[b]	~~3,200[d]~~ 270[b]	2,000[b]	~~920~~ 18[b]	~~5~~ 4.7[r]	~~53~~ 47[r]	*
71-55-6	1,1,1-Trichloroethane	—[e] 1,000,000	~~1,200~~ 1,300[d]	—[e] 1,000,000	~~1,200[d]~~ 130[b]	2[r]	~~9.6~~ 10[r]	*
79-00-5	1,1,2-Trichloroethane	8,200[b]	1,800[d]	~~8,200~~ 820[b]	1,800[d]	~~0.02~~ 0.03[r]	0.3[r]	*
79-01-6	Trichloroethylene	~~520~~ 440[e]	~~8.9~~ 6.3[e]	~~1,200[b]~~ 9,600[e]	~~12~~ 8.8[e]	~~0.06~~ 0.044[r]	~~0.3~~ 0.22[r]	*
75-69-4	Trichlorofluoromethane	610,000[b]	1,400[b]	140,000[b]	90[b]	34[r]	170[r]	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
99-35-4	1,3,5-Trinitrobenzene	61,000[b]	---[c]	6,100[b]	---[c]	3.9[r]	3.9[r]	*
118-96-7	2,4,6-Trinitrotoluene	1,000[b]	---[c]	310[b]	---[c]	0.077[r]	0.077r	0.25
108-05-4	Vinyl acetate	1,000,000	1,600[b]	200,000[b]	10[b]	170[b]	170	*
75-01-4	Vinyl chloride	~~7.9~~ 8[e]	1.1[e]	170[e]	1.1[b]	~~0.01~~ 0.013[r]	~~0.07~~ 0.066[r]	*
108-38-3	m-Xylene	410,000[b]	~~420~~ 410[d]	~~41,000~~ 200,000[b]	~~6.4~~ 26[b]	~~210~~ 200[r]	~~210~~ 200[r]	*
95-47-6	o-Xylene	410,000[b]	~~410~~ 370[d]	~~41,000~~ 200,000[b]	~~6.5~~ 25[b]	~~190~~ 170[r]	~~190~~ 170[r]	*
106-42-3	p-Xylene	410,000[b]	~~460~~ 330[d]	~~41,000~~ 200,000[b]	~~5.9~~ 22[b]	~~200~~ 170[r]	~~200~~ 170[r]	*
1330-20-7	Xylenes (total)	410,000[b]	~~320~~ 280[d]	~~41,000~~ 200,000[b]	~~5.6~~ 27[b]	~~150~~ 200[r]	~~150~~ 200[r]	*
	Ionizable Organics							
65-85-0	Benzoic Acid	1,000,000[b]	---[c]	820,000[b]	---[e] 3.7[b]	~~400~~[b,i] 110[i,r]	~~400~~ 100[i,r]	*
120-83-2	2,4-Dichlorophenol	6,100[b]	---[c]	610[b]	---[c]	~~1~~ 3.3[b,i]	~~1~~ 3.3[i]	*
51-28-5	2,4-Dinitrophenol	4,100[b]	---[c]	~~410~~ 4,100[b]	---[c]	~~0.2~~ 0.21[b]	~~0.2~~ 0.21	3.3
88-85-7	Dinoseb[o]	2,000[b]	---[c]	200[b]	---[c]	~~0.34~~[b] 0.054[i,r]	~~3.4~~[i] 0.54[i,,r]	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
93-65-2	MCPP (Mecoprop)	2,000[b]	---[c]	2,000[b]	---[c]	0.033[r]	0.17[r]	0.066
87-86-5	Pentachlorophenol	24[e,j]	---[c]	~~520~~ 500[e,j]	---[c]	~~0.03~~ 0.11[i,r]	~~0.14~~ 0.57[i,r]	*
~~93-72-1~~	~~2,4,5-TP (Silvex)~~	~~16,000[b]~~	~~—[e]~~	~~1,600~~	~~—[e]~~	~~11[i,r]~~	~~55~~	~~*~~
95-95-4	2,4,5-Trichlorophenol	200,000[b]	---[c]	200,000[b]	---[c]	~~270~~ 440[b,i]	~~1,400~~ 2,200[i]	*
88-06-2	2,4,6- Trichlorophenol	520[e]	~~390~~ 820[e]	11,000[e]	~~540~~ 1,200[e]	~~0.2~~ 0.31[e,i]	~~0.77~~ 1.6[i]	0.66

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	ADL (mg/kg)
	Inorganics							
7440-36-0	Antimony	820[b]	---[c]	~~82~~ 41[b]	---[e] 70,000[b]	0.006[m,r]	0.024[m,r]	*
7440-38-2	Arsenic[l,n]	---[t]	1,200[e]	61[b]	~~25,000e~~ 5,200[b]	0.05[m, r]	0.2[m, r]	*
7440-39-3	Barium	~~140,000~~ 410,000[b]	~~910,000~~[b] ---[c]	~~14,000~~ 140,000[b]	~~870,000~~[b] ---[c]	2.0[m ,r]	2.0[m, r]	*
7440-41-7	Beryllium	4,100[b]	2,100[e]	410[b]	~~44,000~~ 3,500[e]	0.004[m, r]	0.5[m, r]	*
7440-42-8	Boron	410,000[b]	---[c]	41,000[b]	---[c]	2.0[m, r]	2.0[m, r]	*
7440-43-9	Cadmium[l,n]	2,000[b,~~r~~, y]	2,800[e]	200[b,~~r~~, y]	~~59,000~~[e] 8,700[b]	0.005[m, r]	0.05[m, r]	*
7440-70-2	Calcium[n]	---[g]	---[c]	---[g]	---[c]	---[c]	---[c]	*
16887-00-6	Chloride	---[c]	---[c]	---[c]	---[c]	200[m,r]	200[m, r]	*
7440-47-3	Chromium, total	6,100[b, y]	420[e]	~~4,100~~[b] 1,600[y]	~~690~~[b] 8,800[y]	0.1[m,r]	1.0[m,r]	*
16065-83-1	Chromium, ion, trivalent	1,000,000[b]	---[c]	310,000[b]	---[c]	---[g]	---[g]	*
18540-29-9	Chromium, ion, hexavalent	6,100[b]	420[e]	~~4,100~~ 1,600[b]	~~690~~ 8,800[b]	---	---	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	ADL (mg/kg)
7440-48-4	Cobalt	~~120,000~~ 41,000[b]	—[e] 1,800[c]	12,000[b]	—[e] 3,500[b]	1.0[m,r]	1.0[m,r]	*
7440-50-8	Copper[n]	82,000[b]	---[c]	8,200[b]	---[c]	0.65[m,r]	0.65[m,r]	*
57-12-5	Cyanide (amenable)	41,000[b]	---[c]	4,100[b]	---[c]	0.2[q,m,r]	0.6[q,m,r]	*
7782-41-4	Fluoride	120,000[b]	---[c]	12,000[b]	---[c]	4.0[m,r]	4.0[m,r]	*
15438-31-0	Iron	—[e] 1,000,000	---[c]	—[e] 140,000[b]	---[c]	5.0[m,r]	5.0[m,r]	*
7439-92-1	Lead	800[y,x]	---[c]	700[y,x]	---[c]	0.0075[m,r]	0.1[m,r]	*
7439-95-4	Magnesium[n]	---[g]	---[c]	730,000	---[c]	---[c]	---[c]	*
7439-96-5	Manganese	41,000[b,w,v]	91,000[b]	4,100[b,w,v]	8,700[b]	0.15[m,r]	10.0[m,r]	*
7439-97-6	Mercury[l,n,s]	610[b]	~~16~~ 3.1[b,d]	~~61~~ 610[b]	~~0.1~~ 0.072[b]	0.002[m,r]	0.01[m,r]	*
7440-02-0	Nickel[l]	41,000[b]	21,000[e]	4,100[b]	~~440,000[e]~~ 35,000[b]	0.1[m,r]	2.0[m,r]	*
14797-55-8	Nitrate as N[p]	1,000,000[b]	---[c]	330,000[b]	---[c]	10.0[q,m,r]	100[q,r]	*

		Exposure Route-Specific Values for Soils				Values for the Soil Component of the Groundwater Ingestion Exposure Route ~~Values~~		
		Industrial/ - Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Ingestion (mg/kg)	Outdoor Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	ADL (mg/kg)
14797-73-0	Perchlorate	1,400[b]	---[c]	140[b]	---[c]	0.0049[m,r]	0.0049[m,r]	*
7723-14-0	Phosphorus[n]	---[g]	---[c]	---[g]	---[c]	---[c]	---[c]	*
7440-09-7	Potassium[n]	---[g]	---[c]	---[g]	---[c]	---[c]	---[c]	*
7782-49-2	Selenium[l,n]	10,000[b]	---[c]	1,000[b]	---[c]	0.05[m, r]	0.05[m, r]	*
7440-22-4	Silver	10,000[b]	---[c]	1,000[b]	---[c]	0.05[m, r]	---[c]	*
7440-23-5	Sodium[n]	---[g]	---[c]	---[g]	---[c]	---[c]	---[c]	*
14808-79-8	Sulfate	---[c]	---[c]	---[c]	---[c]	400[m, r]	400[m, r]	*
7440-28-0	Thallium	160[b,u]	---[c]	160[b,u]	---[c]	0.002[m, r]	0.02[m, r]	*
7440-62-2	Vanadium	14,000[b]	---[c]	1,400[b]	---[c]	0.049[m, b]	0.1[m, r]	*
7440-66-6	Zinc[l]	610,000[b]	---[c]	61,000[b]	---[c]	5.0[m, r]	10[m, r]	*

"*" indicates that the ADL is less than or equal to the specified remediation objective.

NA means Not Available; no PQL or EQL available in USEPA analytical methods.

Chemical Name and Soil Remediation Objective Notations (2nd, 5th thru 8th Columns)

[a] Soil remediation objectives based on human health criteria only.
[b] Calculated values correspond to a target hazard quotient of 1.
[c] No toxicity criteria available for this route of exposure.
[d] ~~Soil saturation concentration ($C_{[sat]}$) = the concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) have been violated, and alternative modeling approaches are required.~~ Calculated Tier 1 remediation objective exceeds the C_{sat} value of the chemical in soil. Therefore, the C_{sat} of the chemical is shown.
[e] Calculated values correspond to a cancer risk level of 1 in 1,000,000.
[f] See Appendix B, Table G for soil remediation objectives for industrial/commercial properties for the indoor inhalation exposure route.
[g] Chemical-specific properties are such that this route is not of concern at any soil contaminant concentration.
[h] 40 CFR 761 contains applicability requirements and methodologies for the development of PCB remediation objectives. Requests for approval of a Tier 3 evaluation must address the applicability of 40 CFR 761.
[i] Soil remediation objective for pH of 6.8. If soil pH is other than 6.8, refer to Appendix B, Tables C and D in this Part.
[j] Ingestion soil remediation objective adjusted by a factor of 0.5 to account for dermal route.
[k] See Appendix B, Table G for soil gas remediation objectives for industrial/commercial properties for the indoor inhalation exposure route..
[l] Potential for soil-plant-human exposure.
[m] The person conducting the remediation has the option to use: (1) TCLP or SPLP test results to compare with the remediation objectives listed in this Table; (2) the total amount of contaminant in the soil sample results to compare with pH specific remediation objectives listed in Appendix B, Table C or D of this Part (see Section 742.510); or (3) the appropriate background value listed in Appendix A, Table G. If the person conducting the remediation wishes to calculate soil remediation objectives based on background concentrations, this should be done in accordance with Subpart D of this Part.
[n] The Agency reserves the right to evaluate the potential for remaining contaminant concentrations to pose significant threats to crops, livestock, or wildlife.
[o] For agrichemical facilities, remediation objectives for surficial soils which are based on field application rates may be more appropriate for currently registered pesticides. Consult the Agency for further information.
[p] For agrichemical facilities, soil remediation objectives based on site-specific background concentrations of Nitrate as N may be more appropriate. Such determinations shall be conducted in accordance with the procedures set forth in Subparts D and I of this Part.
[q] The TCLP extraction must be done using water at a pH of 7.0.
[r] ~~Value based on dietary Reference Dose~~. Value based on the Groundwater Quality Standard for this chemical pursuant to 35 Ill. Adm. Code 620.
[s] Value for Ingestion based on Reference Dose for Mercuric chloride (CAS No. 7487-94-7); value for Inhalation based on Reference Concentration for elemental Mercury (CAS No. 7439-97-6). Inhalation remediation objective only applies at sites where elemental mercury is a contaminant of concern.
[t] For the ingestion route for arsenic for industrial/commercial, see 742.Appendix A, Table G.
[u] Value based on Reference Dose for Thallium sulfate (CAS No. 7446-18-6).
[w] [v] Value based on Reference Dose adjusted for dietary intake.
[*] [w] For any populated areas as defined in Section 742.200, Appendix A, Table H may be used.
[y] [x] Value based on maintaining fetal blood lead below 10 ug/dl, using the USEPA adults Blood Lead Model.
[y] Values for total Chromium based on toxicity data for hexavalent Chromium.
[z] Values based on a maximum contaminant level.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX B Tier 1 Illustrations and Tables

Section 742.Table C pH Specific Soil Remediation Objectives for Inorganics and Ionizing Organics for the Soil Component of the Groundwater Ingestion Route (Class I Groundwater)

Chemical (totals) (mg/kg)	pH 4.5 to 4.74	pH 4.75 to 5.24	pH 5.25 to 5.74	pH 5.75 to 6.24	pH 6.25 to 6.64	pH 6.65 to 6.89	pH 6.9 to 7.24	pH 7.25 to 7.74	pH 7.75 to 8.24	pH 8.25 to 8.74	pH 8.75 to 9.0
Inorganics											
Antimony	5	5	5	5	5	5	5	5	5	5	5
Arsenic	~~25~~ 5	~~26~~ 5	~~27~~ 5.2	~~28~~ 5.4	~~29~~ 5.6	~~29~~ 5.8	~~29~~ 5.8	~~30~~ 6	~~31~~ 6.2	~~32~~ 6.4	~~33~~ 6.6
Barium	260	490	850	1,200	1,500	1,600	1,700	1,800	2,100	[a]	[a]
Beryllium	1.1	2.1	3.4	6.6	22	63	140	1,000	8,000	[a]	[a]
Cadmium	1.0	1.7	2.7	3.7	5.2	7.5	11	59	430	[a]	[a]
Chromium (+6)	70	62	54	46	40	38	36	32	28	24	21
Copper	330	580	2,100	11,000	59,000	130,000	200,000	330,000	330,000	[a]	[a]
Cyanide	40	40	40	40	40	40	40	40	40	40	40
Lead	23	23	23	23	107	107	107	107	107	107	282[b]
Mercury	0.01	0.01	0.03	0.15	0.89	2.1	3.3	6.4	8.0	[a]	[a]
Nickel	20	36	56	76	100	130	180	700	3,800	[a]	[a]
Selenium	24	17	12	8.8	6.3	5.2	4.5	3.3	2.4	1.8	1.3
Silver	0.24	0.33	0.62	1.5	4.4	8.5	13	39	110	[a]	[a]

Chemical (totals) (mg/kg)	pH 4.5 to 4.74	pH 4.75 to 5.24	pH 5.25 to 5.74	pH 5.75 to 6.24	pH 6.25 to 6.64	pH 6.65 to 6.89	pH 6.9 to 7.24	pH 7.25 to 7.74	pH 7.75 to 8.24	pH 8.25 to 8.74	pH 8.75 to 9.0
Thallium	1.6	1.8	2.0	2.4	2.6	2.8	3.0	3.4	3.8	4.4	4.9
Vanadium	980	980	980	980	980	980	980	980	980	980	980
Zinc	1,000	1,800	2,600	3,600	5,100	6,200	7,500	16,000	53,000	[a]	[a]
Organics											
Benzoic Acid	~~440~~140	~~420~~120	~~410~~120	~~400~~110	~~400~~110	~~400~~110	~~400~~110	~~400~~110	~~400~~110	~~400~~110	~~400~~110
2-Chlorophenol	~~4.0~~1.3	~~4.0~~1.3	~~4.0~~1.3	~~4.0~~1.3	~~3.9~~1.3	~~3.9~~1.3	~~3.9~~1.3	~~3.6~~1.2	~~3.1~~1.2	~~2.2~~1.1	~~1.5~~0.94
2,4-Dichlorophenol	~~1.0~~3.6	~~1.0~~3.6	~~1.0~~3.6	~~1.0~~3.5	~~1.0~~3.4	~~1.0~~3.3	~~1.0~~3.2	~~0.86~~2.7	~~0.69~~1.8	~~0.56~~1.1	~~0.48~~0.67
Dinoseb	~~8.4~~0.72	~~4.5~~0.39	~~1.9~~0.18	~~0.82~~0.093	~~0.43~~0.061	~~0.34~~0.054	~~0.31~~0.051	~~0.27~~0.048	~~0.25~~0.046	~~0.25~~0.046	~~0.25~~0.046
MCPP (Mecoprop)	0.046	0.037	0.034	0.034	0.033	0.033	0.033	0.033	0.033	0.033	0.033
Pentachlorophenol	~~0.54~~2.5	~~0.32~~1.4	~~0.15~~0.62	~~0.07~~0.27	~~0.04~~0.15	~~0.03~~0.12	~~0.02~~0.1	~~0.02~~0.09	~~0.02~~0.086	~~0.02~~0.085	~~0.02~~0.084
~~2,4,5-TP (Silvex)~~	~~26~~	~~16~~	~~12~~	~~11~~	~~11~~	~~11~~	~~11~~	~~11~~	~~11~~	~~11~~	~~11~~
2,4,5-Trichlorophenol	~~400~~740	~~390~~740	~~390~~720	~~370~~670	~~320~~550	~~270~~440	~~230~~360	~~130~~180	~~64~~85	~~36~~46	~~26~~33
2,4,6-Trichlorophenol	~~0.37~~1.3	~~0.36~~1.2	~~0.34~~1	~~0.29~~0.73	~~0.20~~0.43	~~0.15~~0.31	~~0.13~~0.26	~~0.09~~0.19	~~0.07~~0.17	~~0.07~~0.16	~~0.07~~0.16

[a] No data available for this pH range.

[b] For Lead, this value may be used up to a pH of 11.0.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

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NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX B Tier 1 Illustrations and Tables

Section 742.Table D pH Specific Soil Remediation Objectives for Inorganics and Ionizing Organics for the Soil Component of the Groundwater Ingestion Route (Class II Groundwater)

Chemical (totals) (mg/kg)	pH 4.5 to 4.74	pH 4.75 to 5.24	pH 5.25 to 5.74	pH 5.75 to 6.24	pH 6.25 to 6.64	pH 6.65 to 6.89	pH 6.9 to 7.24	pH 7.25 to 7.74	pH 7.75 to 8.24	pH 8.25 to 8.74	pH 8.75 to 9.0
Inorganics											
Antimony	20	20	20	20	20	20	20	20	20	20	20
Arsenic	100	100	100	110	110	120	120	120	120	130	130
Barium	260	490	850	1,200	1,500	1,600	1,700	1,800	2,100	[a]	[a]
Beryllium	140	260	420	820	2,800	7,900	17,000	130,000	1,000,000	[a]	[a]
Cadmium	10	17	27	37	52	75	110	590	4,300	[a]	[a]
Chromium (+6)	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Copper	330	580	2,100	11,000	59,000	130,000	200,000	330,000	330,000	[a]	[a]
Cyanide	120	120	120	120	120	120	120	120	120	120	120
Lead	300	300	300	300	1,420	1,420	1,420	1,420	1,420	1,420	3,760[b]
Mercury	0.05	0.06	0.14	0.75	4.4	10	16	32	40	[a]	[a]
Nickel	400	730	1,100	1,500	2,000	2,600	3,500	14,000	76,000	[a]	[a]
Selenium	24	17	12	8.8	6.3	5.2	4.5	3.3	2.4	1.8	1.3
Thallium	16	18	20	24	26	28	30	34	38	44	49
Zinc	2,000	3,600	5,200	7,200	10,000	12,000	15,000	32,000	110,000	[a]	[a]

Chemical (totals) (mg/kg)	pH 4.5 to 4.74	pH 4.75 to 5.24	pH 5.25 to 5.74	pH 5.75 to 6.24	pH 6.25 to 6.64	pH 6.65 to 6.89	pH 6.9 to 7.24	pH 7.25 to 7.74	pH 7.75 to 8.24	pH 8.25 to 8.74	pH 8.75 to 9.0
Organics											
Benzoic Acid	~~440~~140	~~420~~120	~~410~~120	~~400~~110	~~400~~110	~~400~~110	~~400~~110	~~400~~110	~~400~~110	~~400~~110	~~400~~110
2-Chlorophenol	~~20~~1.3	~~20~~1.3	~~20~~1.3	~~20~~1.3	~~20~~1.3	~~20~~1.3	~~19~~1.3	~~3.6~~1.2	~~3.1~~1.2	~~2.2~~1.1	~~1.5~~0.94
2,4-Dichlorophenol	~~1.0~~18	~~1.0~~18	~~1.0~~18	~~1.0~~18	~~1.0~~17	~~1.0~~17	~~1.0~~16	~~0.86~~13	~~0.69~~9	~~0.56~~1.1	~~0.48~~0.67
Dinoseb	~~84~~7.2	~~45~~3.9	~~19~~1.8	~~8.2~~0.93	~~4.3~~0.61	~~3.4~~0.54	~~3.1~~0.51	~~2.7~~0.48	~~2.5~~0.46	~~2.5~~0.46	~~2.5~~0.46
MCPP (Mecoprop)	0.23	0.19	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Pentachlorophenol	~~2.7~~12	~~1.6~~7	~~0.75~~3.1	~~0.33~~1.4	~~0.18~~0.73	~~0.15~~0.57	~~0.12~~0.52	~~0.11~~0.45	~~0.10~~0.43	~~0.10~~0.42	~~0.10~~0.42
~~2,4,5-TP (Silvex)~~	~~130~~	~~79~~	~~62~~	~~57~~	~~55~~	~~55~~	~~55~~	~~55~~	~~55~~	~~55~~	~~55~~
2,4,5-Trichlorophenol	~~2,000~~3700	~~2,000~~3700	~~1,900~~3600	~~1,800~~3400	~~1,600~~2800	~~1,400~~2200	~~1,200~~1800	~~640~~910	~~64~~420	~~36~~46	~~26~~33
2,4,6-Trichlorophenol	~~1.9~~6.4	~~1.8~~6	~~1.7~~5.1	~~1.4~~3.6	~~1.0~~2.1	~~0.77~~1.6	~~0.13~~1.3	~~0.09~~0.97	~~0.07~~0.85	~~0.07~~0.81	~~0.07~~0.8

[a] No data available for this pH range.

[b] For Lead, this value may be used up to a pH of 11.0.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

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NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX B Tier 1 Illustrations and Tables

Section 742.TABLE E Tier 1 Groundwater Remediation Objectives for the Groundwater Component of the Groundwater Ingestion Route

		Groundwater Remediation Objective[b]	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
	Organics		
83-32-9	Acenaphthene	0.42[c]	2.1[c]
67-64-1	Acetone	6.3[c]	6.3[c]
15972-60-8	Alachlor	0.002[c]	0.01[c]
116-06-3	Aldicarb	0.003[c]	0.015[c]
309-00-2	Aldrin	0.014[a]	0.07
120-12-7	Anthracene	2.1[c]	10.5[c]
1912-24-9	Atrazine	0.003[c]	0.015[c]
71-43-2	Benzene	0.005[c]	0.025[c]
56-55-3	Benzo(*a*)anthracene	0.00013[c]	0.00065[c]
205-99-2	Benzo(*b*)fluoranthene	0.00018[c]	0.0009[c]
207-08-9	Benzo(*k*)fluroanthene	~~0.00017~~ 0.0012[c]	~~0.00085~~ 0.006[c]
50-32-8	Benzo(*a*)pyrene	0.0002[a,c]	~~0.0016~~ 0.002[c]
65-85-0	Benzoïc Acid	28[c]	28[c]
111-44-4	Bis(2-chloroethyl)ether	0.01[a]	0.01
117-81-7	Bis(2-ethylhexyl)phthalate (Di(2-ethylhexyl)phthalate)	0.006[c]	0.06[c]
75-27-4	Bromodichloromethane (Dichlorobromomethane)	0.0002[a]	0.0002
75-25-2	Bromoform	0.001[a]	0.001
71-36-3	Butanol	0.7[c]	0.7
78-93-3	2-Butanone (MEK)	4.2[c]	4.2[c]
85-68-7	Butyl benzyl phthalate	1.4[c]	7.0
86-74-8	Carbazole	— 0.0043[a]	— 0.022
1563-66-2	Carbofuran	0.04[c]	0.2[c]
75-15-0	Carbon disulfide	0.7[c]	3.5[c]
56-23-5	Carbon tetrachloride	0.005[c]	0.025[c]
57-74-9	Chlordane	0.002[c]	0.01[c]
106-47-8	4-Chloroaniline (ρ-Chloroaniline)	0.028[c]	0.028

CAS No.	Chemical Name	Groundwater Remediation Objective[b]	
		Class I (mg/L)	Class II (mg/L)
108-90-7	Chlorobenzene (Monochlorobenzene)	0.1[c]	0.5[c]
124-48-1	Chlorodibromomethane (Dibromochloromethane)	~~0.14~~ 0.06[c]	~~0.14~~ 0.06
67-66-3	Chloroform	~~0.0002~~ 0.07[c]	~~0.001~~ 0.35[c]
95-57-8	2-Chlorophenol ~~(pH 4.9-7.3)~~	0.035[c]	~~0.175~~ 0.035[c]
	~~2-Chlorophenol (pH 7.4-8.0)~~	~~0.035~~	~~0.035~~
218-01-9	Chrysene	~~0.0063~~ 0.012[c]	~~0.0075~~ 0.06[c]
94-75-7	2,4-D	0.07[c]	0.35[c]
75-99-0	Dalapon	0.2[c]	2.0[c]
72-54-8	DDD	0.014[a]	0.07
72-55-9	DDE	0.01[a]	0.05
50-29-3	DDT	0.006[a]	0.03
53-70-3	Dibenzo(*a,h*)anthracene	0.0003[c]	0.0015[c]
96-12-8	1,2-Dibromo-3-chloropropane	0.0002[c]	0.002[c]
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.00005[c]	0.0005[c]
84-74-2	Di-*n*-butyl phthalate	0.7[c]	3.5[c]
1918-00-9	Dicamba	0.21[c]	0.21[c]
95-50-1	1,2-Dichlorobenzene (*o* – Dichlorobenzene)	0.6[c]	1.5[c]
106-46-7	1,4-Dichlorobenzene (*p* – Dichlorobenzene)	0.075[c]	0.375[c]
91-94-1	3,3'-Dichlorobenzidine	0.02[a]	0.1
75-71-8	Dichlorodifluoromethane	1.4[c]	7.0[c]
75-34-3	1,1-Dichloroethane	~~0.7~~ 1.4[c]	~~3.5~~ 7.0[c]
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	0.005[c]	0.025[c]
75-35-4	1,1-Dichloroethylene[b]	0.007[c]	0.035[c]
156-59-2	*cis*-1,2-Dichloroethylene	0.07[c]	0.2[c]
156-60-5	*trans*-1,2-Dichloroethylene	0.1[c]	0.5[c]
120-83-2	2,4-Dichlorophenol (pH 4.5-8.0)	0.021[c]	~~0.021~~ 0.105
	2,4-Dichlorophenol (pH 8.1-9.0)	0.021	0.021
78-87-5	1,2-Dichloropropane	0.005[c]	0.025[c]

		Groundwater Remediation Objective[b]	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	0.001[a]	0.005
60-57-1	Dieldrin	0.009[a]	0.045
84-66-2	Diethyl phthalate	5.6[c]	5.6
105-67-9	2,4-Dimethylphenol	0.14[c]	0.14
99-65-0	1,3-Dinitrobenzene	0.0007[c]	0.0007[c]
51-28-5	2,4-Dinitrophenol	0.014[c]	0.014
121-14-2	2,4-Dinitrotoluene	0.0001[c]	0.0001[c]
606-20-2	2,6-Dinitrotoluene	0.00031[c]	0.00031[c]
88-85-7	Dinoseb	0.007[c]	0.07[c]
117-84-0	Di-*n*-octyl phthalate	~~0.14~~ 0.28[c]	~~0.7~~ 1.4[c]
123-91-1	p-Dioxane	0.0077[c]	0.0077[c]
115-29-7	Endosulfan	0.042[c]	0.21
145-73-3	Endothall	0.1[c]	0.1[c]
72-20-8	Endrin	0.002[c]	0.01[c]
100-41-4	Ethylbenzene	0.7[c]	1.0[c]
206-44-0	Fluoranthene	~~0.28~~ 0.28[c]	~~1.4~~ 1.4[c]
86-73-7	Fluorene	0.28[c]	1.4[c]
76-44-8	Heptachlor	0.0004[c]	0.002[c]
1024-57-3	Heptachlor epoxide	0.0002[c]	0.001[c]
118-74-1	Hexachlorobenzene	0.00006[a]	0.0003
319-84-6	*alpha*-HCH (*alpha*-BHC)	0.00011[c]	0.00055[c]
58-89-9	*Gamma*-HCH (Lindane)	0.0002[c]	0.001[c]
77-47-4	Hexachlorocyclopentadiene	0.05[c]	0.5[c]
67-72-1	Hexachloroethane	0.007[c]	0.035
2691-41-0	HMX	1.4[c]	1.4[c]
193-39-5	Indeno(1,2,3-*c,d*)pyrene	0.00043[a] [c]	~~0.00215~~ 0.0022[c]
78-59-1	Isophorone	1.4[c]	1.4
98-82-8	Isopropylbenzene (Cumene)	0.7[c]	3.5[c]
93-65-2	MCPP (Mecoprop)	0.007[c]	0.035[c]
72-43-5	Methoxychlor	0.04[c]	0.2[c]
74-83-9	Methyl bromide (Bromomethane)	0.0098[c]	0.049

CAS No.	Chemical Name	Groundwater Remediation Objective[b]	
		Class I (mg/L)	Class II (mg/L)
1634-04-4	Methyl tertiary-butyl ether	0.07[c]	0.07[c]
75-09-2	Methylene chloride (Dichloromethane)	0.005[c]	0.05[c]
91-57-6	2-Methylnaphthalene	0.028[c]	0.14[c]
95-48-7	2-Methylphenol (*o*-Cresol)	0.35[c]	0.35[c]
91-20-3	Naphthalene	0.14[c]	0.22
98-95-3	Nitrobenzene[b]	0.0035[c]	0.0035[c]
86-30-6	*N*-Nitrosodiphenylamine	0.0032[a]	0.016
621-64-7	*N*-Nitrosodi-*n*-propylamine	0.0018[a]	0.0018
87-86-5	Pentachlorophenol	0.001[c]	0.005[c]
108-95-2	Phenol	0.1[c]	0.1[c]
1918-02-1	Picloram	0.5[c]	5.0[c]
1336-36-3	Polychlorinated biphenyls (PCBs)	0.0005[c]	0.0025[c]
129-00-0	Pyrene	0.21[c]	1.05[c]
121-82-4	RDX	0.084[c]	0.084[c]
122-34-9	Simazine	0.004[c]	0.04[c]
100-42-5	Styrene	0.1[c]	0.5[c]
93-72-1	2,4,5-TP (Silvex)	0.05[c]	0.25[c]
127-18-4	Tetrachloroethylene (Perchloroethylene)	0.005[c]	0.025[c]
108-88-3	Toluene	1.0[c]	2.5[c]
8001-35-2	Toxaphene	0.003[c]	0.015[c]
120-82-1	1,2,4-Trichlorobenzene	0.07[c]	0.7[c]
71-55-6	1,1,1-Trichloroethane[b]	0.2[c]	1.0[c]
79-00-5	1,1,2-Trichloroethane	0.005[c]	0.05[c]
79-01-6	Trichloroethylene	0.005[c]	0.025[c]
75-69-4	Trichlorofluoromethane	2.1[c]	10.5[c]
95-95-4	2,4,5-Trichlorophenol (pH ~~4.9~~ 4.5-~~7.8~~ 8.1)	0.7[c]	3.5
	2,4,5-Trichlorophenol (pH ~~7.9~~ 8.2-~~8.0~~ 9.0)	0.7	0.7
88-06-2	2,4,6-Trichlorophenol ~~(pH 4.9-6.8)~~	0.01[a]	0.05
	~~2,4,6-Trichlorophenol (pH 6.9-8.0)~~	~~0.01~~	~~0.01~~
99-35-4	1,3,5-Trinitrobenzene	0.84[c]	0.84[c]

CAS No.	Chemical Name	Groundwater Remediation Objective[b]	
		Class I (mg/L)	Class II (mg/L)
118-96-7	2,4,6-Trinitrotoluene	0.014[c]	0.014[c]
108-05-4	Vinyl acetate	7.0~~[e]~~	7.0
75-01-4	Vinyl chloride	0.002[c]	0.01[c]
1330-20-7	Xylenes (total)	10.0[c]	10.0[c]
	Inorganics		
7440-36-0	Antimony	0.006[c]	0.024[c]
7440-38-2	Arsenic	~~0.05~~[e] 0.010[c]	0.2[c]
7440-39-3	Barium	2.0[c]	2.0[c]
7440-41-7	Beryllium	0.004[c]	0.5[c]
7440-42-8	Boron	2.0[c]	2.0[c]
7440-43-9	Cadmium	0.005[c]	0.05[c]
7440-70-2	Calcium	---[d]	---[d]
16887-00-6	Chloride	200[c]	200[c]
7440-47-3	Chromium, total	0.1[c]	1.0[c]
18540-29-9	Chromium, ion, hexavalent	---	---
7440-48-4	Cobalt	1.0[c]	1.0[c]
7440-50-8	Copper	0.65[c]	0.65[c]
57-12-5	Cyanide	0.2[c]	0.6[c]
7782-41-4	Fluoride	4.0[c]	4.0[c]
15438-31-0	Iron	5.0[c]	5.0[c]
7439-92-1	Lead	0.0075[c]	0.1[c]
7439-95-4	Magnesium	---[d]	---[d]
7439-96-5	Manganese	0.15[c]	10.0[c]
7439-97-6	Mercury	0.002[c]	0.01[c]
7440-02-0	Nickel	0.1[c]	2.0[c]
14797-55-8	Nitrate as N	10.0[c]	100[c]
14797-73-0	Perchlorate	0.0049[c]	0.0049[c]
7723-14-0	Phosphorus	---[d]	---[d]
7440-09-7	Potassium	---[d]	---[d]
7782-49-2	Selenium	0.05[c]	0.05[c]
7440-22-4	Silver	0.05[c]	---
7440-23-5	Sodium	---[d]	---[d]

		Groundwater Remediation Objective[b]	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
14808-79-8	Sulfate	400[c]	400[c]
7440-28-0	Thallium	0.002[c]	0.02[c]
7440-62-2	Vanadium[b]	0.049[c]	0.1[c]
7440-66-6	Zinc	5.0[c]	10[c]

Chemical Name and Groundwater Remediation Objective Notations

[a] The groundwater remediation objective is equal to the ADL for carcinogens according to the procedures specified in 35 Ill. Adm. Code 620 or the 1 in 1,000,000 cancer risk level, whichever is greater.

[b] ~~Oral Reference Dose and/or Reference Concentration under review by USEPA. Listed values subject to change.~~ These Groundwater Remediation Objectives are for the Direct Ingestion of Groundwater Component of the Groundwater Ingestion Route. For values to use when calculating the Soil Remediation Objective for the Soil Component of the Groundwater Ingestion Route, see Section 742.Appendix B, Table F.

[c] Value listed is also the Groundwater Quality Standard for this chemical pursuant to 35 Ill. Adm. Code 620.410 for Class I Groundwater or 35 Ill. Adm. Code 620.420 for Class II Groundwater.

[d] This chemical is included in the Total Dissolved Solids (TDS) Groundwater Quality Standard of 1,200 mg/l pursuant to 35 Ill. Adm. Code 620.410 for Class I Groundwater or 35 Ill. Adm. Code 620.420 for Class II Groundwater.

[e] Value for non-carcinogens calculated according to the procedures in 35 Ill. Adm. Code 620.Appendix A.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX B Tier 1 Illustrations and Tables

Section 742.TABLE F Values Used to Calculate the Tier 1 Soil Remediation Objectives for the Soil Component of the Groundwater Ingestion Route

		GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
	Organics		
83-32-9	Acenaphthene	~~2.0~~[b] 0.42[c]	~~10~~ 2.1[c]
67-64-1	Acetone	6.3[c]	6.3[c]
15972-60-8	Alachlor	0.002[c]	0.01[c]
116-06-3	Aldicarb	0.003[c]	0.015[c]
309-00-2	Aldrin	5.0E-6[b]	2.5E-5
120-12-7	Anthracene	~~10~~[b] 2.1[c]	~~50~~ 10.5[c]
1912-24-9	Atrazine	0.003[c]	0.015[c]
71-43-2	Benzene	0.005[c]	0.025[c]
56-55-3	Benzo(*a*)anthracene	~~0.0001~~[b] 0.00013[c]	~~0.0005~~ 0.00065[c]
205-99-2	Benzo(*b*)fluoranthene	~~0.0001~~[b] 0.00018[c]	~~0.0005~~ 0.0009[c]
207-08-9	Benzo(*k*)fluroanthene	~~0.001~~[b] 0.0012[c]	~~0.005~~ 0.006[c]
50-32-8	Benzo(*a*)pyrene	0.0002[a,c]	0.002[c]
65-85-0	Benzoic Acid	~~100~~[b] 28.0[c]	~~100~~ 28.0[c]
111-44-4	Bis(2-chloroethyl)ether	8.0E-5[b]	8.0E-5
117-81-7	Bis(2-ethylhexyl)phthalate (Di(2-ethylhexyl)phthalate)	0.006[a,c]	0.06[c]
75-27-4	Bromodichloromethane (Dichlorobromomethane)	0.1[b]	0.1
75-25-2	Bromoform	0.1[b]	~~0.01~~ 0.1
71-36-3	Butanol	4.0[b]	4.0
78-93-3	2-Butanone (MEK)	4.2[c]	4.2[c]
85-68-7	Butyl benzyl phthalate	7.0[b]	35
86-74-8	Carbazole	0.004[b]	0.02
1563-66-2	Carbofuran	0.04[c]	0.2[c]
75-15-0	Carbon disulfide	~~4.0~~[b] 0.7[c]	~~20~~ 3.5[c]
56-23-5	Carbon tetrachloride	0.005[c]	0.025[c]
57-74-9	Chlordane	0.002[c]	0.01[c]

CAS No.	Chemical Name	GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
		Class I (mg/L)	Class II (mg/L)
106-47-8	4-Chloroaniline (ρ-Chloroaniline)	0.1[b]	0.1
108-90-7	Chlorobenzene (Monochlorobenzene)	0.1[c]	0.5[c]
124-48-1	Chlorodibromomethane (Dibromochloromethane)	0.06[b]	0.06
67-66-3	Chloroform	~~0.1~~[b] 0.07[c]	~~0.5~~ 0.35[c]
95-57-8	2-Chlorophenol ~~(pH 4.9-7.3)~~	0.2[b]	~~1.0~~ 0.2[b]
	~~2-Chlorophenol (pH 7.4-8.0)~~	~~0.2~~	~~0.2~~
218-01-9	Chrysene	~~0.1~~[b] 0.012[c]	~~0.05~~ 0.06[c]
94-75-7	2,4-D	0.07[c]	0.35[c]
75-99-0	Dalapon	0.2[c]	2.0[c]
72-54-8	DDD	0.0004[b]	0.002
72-55-9	DDE	0.0003[b]	0.0015
50-29-3	DDT	0.0003[b]	0.0015
53-70-3	Dibenzo(*a,h*)anthracene	~~1.0E-5~~[b] 0.0003[c]	~~5.0E-5~~ 0.0015[c]
96-12-8	1,2-Dibromo-3-chloropropane	0.0002[c]	0.002 [c]
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.00005[a,c]	0.0005[c]
84-74-2	Di-*n*-butyl phthalate	~~4.0~~[b] 0.7[c]	~~20~~ 3.5[c]
1918-00-9	Dicamba	0.21[c]	0.21[c]
95-50-1	1,2-Dichlorobenzene (*o* – Dichlorobenzene)	0.6[c]	1.5[c]
106-46-7	1,4-Dichlorobenzene (*p* – Dichlorobenzene)	0.075[c]	0.375[c]
91-94-1	3,3'-Dichlorobenzidine	0.0002[b]	0.001
75-71-8	Dichlorodifluoromethane	1.4[c]	7.0[c]
75-34-3	1,1-Dichloroethane	~~4.0~~[b] 1.4[c]	~~20~~ 7.0[c]
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	0.005[c]	0.025[c]
75-35-4	1,1-Dichloroethylene	0.007[c]	0.035[c]
156-59-2	*cis*-1,2-Dichloroethylene	0.07[c]	0.2[c]
156-60-5	*trans*-1,2-Dichloroethylene	0.1[c]	0.5[c]
120-83-2	2,4-Dichlorophenol (pH 4.5-8.0)	0.1[b]	0.5
	2,4-Dichlorophenol (pH 8.1-9.0)	0.1	0.1

CAS No.	Chemical Name	GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
		Class I (mg/L)	Class II (mg/L)
78-97-5	1,2-Dichloropropane	0.005[c]	0.025[c]
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	~~0.0005[b]~~ 0.00085[d]	~~0.0025~~ 0.0042
60-57-1	Dieldrin	5.0E-6[b]	2.5E-5
84-66-2	Diethyl phthalate	~~30[b]~~ 5.6[c]	~~30~~ 5.6[c]
105-67-9	2,4-Dimethylphenol	0.7[b]	0.7
75-71-8	1,3-Dinitrobenzene	0.0007[c]	0.0007[c]
51-28-5	2,4-Dinitrophenol	0.04[b]	0.04
121-14-2	2,4-Dinitrotoluene	0.0001[c]	0.0001[c]
606-20-2	2,6-Dinitrotoluene	~~0.0001[b]~~ 0.00031[c]	~~0.0001~~ 0.00031[c]
88-85-7	Dinoseb	0.007[c]	0.07[c]
117-84-0	Di-*n*-octyl phthalate	~~0.7[b]~~ 0.28[c]	~~3.5~~ 1.4[c]
123-91-1	p-Dioxane	0.0077[c]	0.0077[c]
115-29-7	Endosulfan	0.2[b]	1.0
145-73-3	Endothall	0.1[c]	0.1[c]
72-20-8	Endrin	0.002[c]	0.01[c]
100-41-4	Ethylbenzene	0.7[c]	1.0[c]
206-44-0	Fluoranthene	~~1.0[b]~~ 0.28[c]	~~5.0~~ 1.4[c]
86-73-7	Fluorene	~~1.0[b]~~ 0.28[c]	~~5.0~~ 1.4[c]
76-44-8	Heptachlor	0.0004[c]	0.002[c]
1024-57-3	Heptachlor epoxide	0.0002[c]	0.001[c]
118-74-1	Hexachlorobenzene	0.001[b]	0.005
319-84-6	*alpha*-HCH (*alpha*-BHC)	~~1.0E-5[b]~~ 0.00011[c]	~~5.0E-5~~ 0.00055[c]
58-89-9	*Gamma*-HCH (Lindane)	0.0002[c]	0.001[c]
77-47-4	Hexachlorocyclopentadiene	0.05[c]	0.5[c]
67-72-1	Hexachloroethane	0.007[d]	0.035
2691-41-0	HMX	1.4[c]	1.4[c]
193-39-5	Indeno(1,2,3-*c,d*)pyrene	~~0.0001[b]~~ 0.00043[c]	~~0.0005~~ 0.0022[c]
78-59-1	Isophorone	1.4	1.4
98-82-8	Isopropylbenzene (Cumene)	0.7[c]	3.5[c]
93-65-2	MCPP (Mecoprop)	0.007[c]	0.035[c]
72-43-5	Methoxychlor	0.04[c]	0.2[c]

CAS No.	Chemical Name	GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
		Class I (mg/L)	Class II (mg/L)
74-83-9	Methyl bromide (Bromomethane)	0.05[b]	0.25
1634-04-4	Methyl tertiary-butyl ether	0.07[c]	0.07[c]
75-09-2	Methylene chloride (Dichloromethane)	0.005[c]	0.05[c]
93-65-2	2-Methylnaphthalene	0.028[c]	0.14[c]
95-48-7	2-Methylphenol (*o*-Cresol)	~~2.0~~[b] 0.35[c]	~~2.0~~ 0.35[c]
91-20-3	Naphthalene	0.14[c]	0.22[c]
98-95-3	Nitrobenzene	~~0.02~~[b] 0.0035[c]	~~0.02~~ 0.0035[c]
86-30-6	*N*-Nitrosodiphenylamine	0.02[b]	0.1
621-64-7	*N*-Nitrosodi-*n*-propylamine	1.0E-5[b]	1.0E-5
87-86-5	Pentachlorophenol	0.001[a,c]	0.005[c]
108-95-2	Phenol	0.1[c]	0.1[c]
1918-02-1	Picloram	0.5[c]	5.0[c]
1336-36-3	Polychlorinated biphenyls (PCBs)	---	---
129-00-0	Pyrene	~~1.0~~[b] 0.21[c]	~~5.0~~ 1.05[c]
121-82-4	RDX	0.084[c]	0.084[c]
122-34-9	Simazine	0.004[c]	0.04[c]
100-42-5	Styrene	0.1[c]	0.5[c]
93-72-1	2,4,5-TP (Silvex)	0.05[c]	0.25[c]
127-18-4	Tetrachloroethylene (Perchloroethylene)	0.005[c]	0.025[c]
108-88-3	Toluene	1.0[c]	2.5[c]
8001-35-2	Toxaphene	0.003[c]	0.015[c]
120-82-1	1,2,4-Trichlorobenzene	0.07[c]	0.7[c]
71-55-6	1,1,1-Trichloroethane	0.2[c]	1.0[c]
79-00-5	1,1,2-Trichloroethane	0.005[c]	0.05[c]
79-01-6	Trichloroethylene	0.005[c]	0.025[c]
75-69-4	Trichlorofluoromethane	2.1[c]	10.5[c]
95-95-4	2,4,5-Trichlorophenol (pH ~~4.9~~ 4.5-~~7.8~~ 8.1)	4.0[b]	20
	2,4,5-Trichlorophenol (pH ~~7.9~~ 8.2-~~8.0~~ 9.0)	4.0	4.0
88-06-2	2,4,6-Trichlorophenol ~~(pH 4.9-6.8)~~	0.008[b]	0.04

CAS No.	Chemical Name	GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
		Class I (mg/L)	Class II (mg/L)
	~~2,4,6-Trichlorophenol (pH 6.9-8.0)~~	~~0.008~~	~~0.008~~
99-35-4	1,3,5-Trinitrobenzene	0.84[c]	0.84[c]
118-96-7	2,4,6-Trinitrotoluene	0.014[c]	0.014[c]
108-05-4	Vinyl acetate	40[b]	40
75-01-4	Vinyl chloride	0.002[c]	0.01[c]
1330-20-7	Xylenes (total)	10.0[c]	10.0[c]
	Inorganics		
7440-36-0	Antimony	0.006[c]	0.024[c]
7440-38-2	Arsenic	~~0.05~~[e] 0.010[c]	0.2[c]
7440-39-3	Barium	2.0[c]	2.0[c]
7440-41-7	Beryllium	0.004[c]	0.5[c]
7440-42-8	Boron	2.0[c]	2.0[c]
7440-43-9	Cadmium	0.005[c]	0.05[c]
7440-70-2	Calcium	---	---
16887-00-6	Chloride	200[c]	200[c]
7440-47-3	Chromium, total	0.1[c]	1.0[c]
18540-29-9	Chromium, ion, hexavalent	---	---
7440-48-4	Cobalt	1.0[c]	1.0[c]
7440-50-8	Copper	0.65[c]	0.65[c]
57-12-5	Cyanide	0.2[c]	0.6[c]
7782-41-4	Fluoride	4.0[c]	4.0[c]
15438-31-0	Iron	5.0[c]	5.0[c]
7439-92-1	Lead	0.0075[c]	0.1[c]
7439-95-4	Magnesium	---	---
7439-96-5	Manganese	0.15[c]	10.0[c]
7439-97-6	Mercury	0.002[c]	0.01[c]
7440-02-0	Nickel	0.1[c]	2.0[c]
14797-55-8	Nitrate as N	10.0[c]	100[c]
14797-73-0	Perchlorate	0.0049[c]	0.0049[c]
7723-14-0	Phosphorus	---	---
7440-09-7	Potassium	---	---
7782-49-2	Selenium	0.05[c]	0.05[c]

CAS No.	Chemical Name	GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
		Class I (mg/L)	Class II (mg/L)
7440-22-4	Silver	0.05[c]	---
7440-23-5	Sodium	---	---
14808-79-8	Sulfate	400[c]	400[c]
7440-28-0	Thallium	0.002[c]	0.02[c]
7440-62-2	Vanadium	0.049[c]	0.1[c]
7440-66-6	Zinc	5.0[c]	10[c]

Chemical Name and Groundwater Remediation Objective Notations

[a] The Equation S17 is used to calculate the Soil Remediation Objective for the Soil Component of the Groundwater Ingestion Route; this equation requires calculation of the Target Soil Leachate Concentration (C_w) from Equation S18: $C_w = DF \times GW_{obj}$.

[b] Value listed is the Water Health Based Limit (HBL) for this chemical from Soil Screening Guidance: User's Guide, incorporated by reference at Section 742.210. The HBL is equal to the non-zero MCLG (if available); the MCL (if available); or, for carcinogens, a cancer risk of 1.0E-6 (based on a 30 year and 350 days/year exposure scenario), and for noncarcinogens is equal to a Hazard Quotient of 1.0. NOTE: These GW_{obj} concentrations are not equal to the Tier 1 Groundwater Remediation Objectives for the Direct Ingestion of Groundwater Component of the Groundwater Ingestion Route, listed in Section 742.Appendix B, Table E.

[c] Value listed is also the Groundwater Quality Standard for this chemical pursuant to 35 Ill. Adm. Code 620.410 for Class I Groundwater or 35 Ill. Adm. Code 620.420 for Class II Groundwater.

[d] Value listed is equivalent to the Human Threshold Toxicant Advisory Concentration (HTTAC) calculated according to the methods in 35 Ill. Adm. Code 620.Appendix A for noncarcinogens. For carcinogens, the value listed is equal to the 1.0E-6 risk level (based on a 30 year and 350 days/year exposure scenario).

(Source: Amended at ____ Ill. Reg. _____, effective _____)

Section 742. APPENDIX B: Tier 1 Illustrations and Tables

Section 742. TABLE G: Tier 1 Indoor Inhalation Remediation Objectives for Residential and Industrial/Commercial Properties for the Indoor Inhalation Exposure Route[a]

	Soil			Groundwater		Soil Gas	
Chemical Name	Residential (mg/kg)	Industrial/ Commercial (mg/kg)	ADL (mg/kg)	Residential (mg/L)	Industrial/ Commercial (mg/L)	Residential (mg/m^3)	Industrial/ Commercial (mg/m^3)
Acetone	100,000[c]	100,000[c]	*	1,000,000[h]	1,000,000[h]	750,000[g]	750,000[g]
Benzene	0.069[d]	0.51[d]	*	0.36[d]	2.4[d]	41[d]	300[d]
Bis(2-chloroethyl)ether	0.5[d]	3.7[d]	0.66	4.0[d]	30[d]	1.2[d]	8.7[d]
Bromodichloromethane	1,400[c]	1,400[c]	*	6,700[h]	6,700[h]	450,000[g]	450,000[g]
Bromoform	49[d]	360[d]	*	170[d]	1,300[d]	1,800[d]	13,300[d]
Butanol	8,300[c]	8,300[c]	NA	74,000[h]	74,000[h]	29,000[g]	29,000[g]
2-Butanone (MEK)	23,000[c]	23,000[c]	*	220,000[h]	220,000[h]	440,000	2,700,000
Carbon disulfide	38[b]	230[b]	*	130[b]	710[d]	81,000[b]	500,000[b]
Carbon tetrachloride	0.021[d]	0.15[d]	*	0.041[d]	0.27[d]	24[d]	180[d]
Chlorobenzene	54[b]	330[b]	*	120[b]	470[b]	8,300[b]	50,600[b]
Chlorodibromomethane	630[c]	630[c]	*	2,600[h]	2,600[h]	57,000[g]	57,000[g]
Chloroform	0.028[d]	0.2[d]	*	0.15[d]	1[d]	12[d]	87[d]
2-Chlorophenol	49,000[c]	49,000[c]	*	220,000[h]	220,000[h]	17,000[g]	17,000[g]
Dalapon	99,000[c,f]	99,000[c,f]	*	900,000[h]	900,000[h]	1,500[f,g]	1,500[f,g]
1,2-dibromo-3-chloropropane	0.0073[d]	0.054[d]	0.005	0.028[d]	0.21[d]	0.17[d]	1.3[d]
1,2-Dibromoethane	0.022[d]	0.16[d]	0.005	0.11[d]	0.79[d]	1.6[d]	12[d]
1,2-Dichlorobenzene	200[c]	200[c]	*	156[h]	156[h]	11,000[g]	11,000[g]
1,4-Dichlorobenzene	1.3[d]	9.8[d]	*	0.85[d]	6[d]	317[d]	270[d]
Dichlorodifluoromethane	6.8[b]	42[b]	*	5.2[b]	28[b]	32,000[b]	195,000[b]
1,1-Dichloroethane	110[b]	670[b]	*	660[b]	3,800[b]	81,000[b]	500,000[b]
1,2-Dichloroethane	0.066[d]	0.48[d]	*	0.48[d]	3.4[d]	10[d]	77[d]

Chemical Name	Soil			Groundwater		Soil Gas	
	Residential (mg/kg)	Industrial/ Commercial (mg/kg)	ADL (mg/kg)	Residential (mg/L)	Industrial/ Commercial (mg/L)	Residential (mg/m^3)	Industrial/ Commercial (mg/m^3)
1,1-Dichloroethylene	13[b]	77[b]	*	49[b]	260[b]	240[b]	1,600[b]
cis-1,2-Dichloroethylene	700[c]	700[c]	*	3,500[h]	3,500[h]	27,000[b]	1,100,000[g]
Trans-1,2-Dichloroethylene	10[b]	63[b]	*	50[b]	280[b]	10,000[b]	63,000[b]
1,2-Dichloropropane	0.023[d]	0.17[d]	*	0.12[d]	0.85[d]	7.2[d]	53[d]
1,3-Dichloropropylene (cis + trans)	0.061[d]	0.45[d]	0.005	0.35[d]	2.3[d]	110[d]	830[d]
p-Dioxane	14[c]	110[c]	*	140[d]	1,000[d]	15[d]	110[d]
Ethylbenzene	130[c]	130[c]	*	170[h]	170[h]	59,000[g]	59,000[g]
Heptachlor	0.34[d]	1.1[c]	0.871	0.057[d]	0.18[h]	0.97[d]	7.1[d]
Hexachlorobenzene	0.25[c]	0.25[c]	*	0.086[d]	0.62[d]	0.28[g]	0.28[g]
Hexachlorocyclopentadiene	5[b]	30[b]	*	0.24[b]	1.4[b]	87[b]	530[b]
Hexachloroethane	160[c]	160[c]	*	50[h]	50[h]	2,800[g]	2,800[g]
Isophorone	1,800[c]	1,800[c]	*	12,000[h]	12,000[h]	3,400[g]	3,400[g]
Mercury	0.45[c,i]	0.45[c,i]	*	0.06[h,i]	0.06[h,i]	22[g,i]	22[g,i]
Isopropylbenzene (Cumene)	21[b]	130[b]	*	4.8[b]	25[b]	30,000[g]	30,000[g]
Methyl bromide	0.71[b]	4.3[b]	*	5.3[b]	30[b]	830[b]	5,000[b]
Methyl tertiary-butyl ether	2,900[b]	6,300[c]	*	24,000[b]	51,000[h]	350,000[b]	1,200,000[g]
Methylene chloride	1.4[d]	10[d]	*	11[d]	80[d]	590[d]	4,400[d]
2-Methylnaphthalene	83[c]	83[c]	*	25[h]	25[h]	530[g]	530[g]
2-Methylphenol (o-cresol)	4,800[c]	4,800[c]	*	26,000[h]	26,000[h]	1,800[g]	1,800[g]
Naphthalene	34[c]	34[c]	*	31[h]	31[h]	610[b]	620[g]
Nitrobenzene	140[b]	380[c]	*	770[b]	2,100[h]	310[b]	1,700[g]
n-Nitrosodi-n-propylamine	0.43[d]	3.1[d]	*	3.3[d]	24[d]	0.182[d]	1.34[d]
Phenol	12,000[c]	12,000[c]	*	83,000[h]	83,000[h]	150[g]	150[g]
Polychlorinated biphenyls (PCBs)	---[e]	---[e]	*	---[e]	---[e]	2.2[d]	9[g]
Styrene	230[c]	230[c]	*	310[h]	310[h]	34,000[g]	34,000[g]
Tetrachloroethylene	0.24[d]	1.7[d]	*	0.21[d]	1.4[d]	66[d]	490[d]

Chemical Name	Soil			Groundwater		Soil Gas	
	Residential (mg/kg)	Industrial/ Commercial (mg/kg)	ADL (mg/kg)	Residential (mg/L)	Industrial/ Commercial (mg/L)	Residential (mg/m^3)	Industrial/ Commercial (mg/m^3)
Toluene	240[c]	240[c]	*	530[h]	530[h]	140,000[g]	140,000[g]
1,2,4-Trichlorobenzene	220[b]	980[c]	*	35[h]	35[h]	1,600[b]	4,300[g]
1,1,1-Trichloroethane	560[c]	560[c]	*	1,300[h]	1,300[h]	770,000[b]	870,000[g]
1,1,2-Trichloroethane	900[c]	900[c]	*	4,400[h]	4,400[h]	170,000[g]	170,000[g]
Trichloroethylene	0.26[d]	1.9[d]	*	0.89[d]	6[d]	180[d]	1,300[d]
Trichlorofluoromethane	31[b]	190[b]	*	48	260	97,000[b]	595,000[b]
Vinyl acetate	270[b]	1,600[b]	*	2,500[b]	15,000[b]	28,000[b]	174,000[b]
Vinyl chloride	0.011[d]	0.15[d]	*	0.05[d]	0.64[d]	30[d]	440[d]
m-Xylene	100[b]	150[c]	*	130[b]	160[h]	17,000[b]	52,000[g]
o-Xylene	98[b]	140[c]	*	150[b]	180[h]	17,000[b]	52,000[g]
p-Xylene	75[b]	120[c]	*	120[b]	160[h]	16,000[b]	55,000[g]
Xylenes (total)	63[b,f]	100[c,f]	*	80[b]	110[h]	16,000[b]	49,000[g]

Chemical Name and Soil Remediation Objective Notations

[a] Soil remediation objectives based on human health criteria only.
[b] Calculated values correspond to a target hazard quotient of 1.
[c] Calculated Tier 1 remediation objective exceeds the C_{sat} value of the chemical in soil. Therefore, the C_{sat} of the chemical is shown.
[d] Calculated values correspond to a cancer risk level of 1 in 1,000,000.
[e] 40 CFR 761 contains applicability requirements and methodologies for the development of PCB remediation objectives. Requests for approval of a Tier 3 evaluation must address the applicability of 40 CFR 761.
[f] Calculated at 25°C. For Dalapon the critical temperature (Tc) is not available. For Xylenes (total), the enthalpy of vaporization (Hv,b) at the normal boiling point is not available.
[g] Calculated Tier 1 remediation objective exceeds the C_vsat value of the chemical in soil gas. Therefore, the C_vsat of the chemical is shown.
[h] Calculated Tier 1 remediation objective exceeds the solubility of the chemical in water. Therefore, the solubility of the chemical is shown.
[i] Mercury is measured in mg/L.

(Source: Added at ____ Ill. Reg. _____, effective _____)

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Section 742.APPENDIX C Tier 2 Illustrations and Tables

Section 742.Table B SSL Parameters

Symbol	Parameter	Units	Source	Parameter Value(s)
AT	Averaging Time for Noncarcinogens in Ingestion Equation	yr		Residential = 6 Industrial/Commercial = 25 Construction Worker = 0.115
AT	Averaging Time for Noncarcinogens in Inhalation Equation	yr		Residential = 30 Industrial/Commercial = 25 Construction Worker = 0.115
AT_c	Averaging Time for Carcinogens	yr	SSL	70
BW	Body Weight	kg		Residential = 15, noncarcinogens 70, carcinogens Industrial/Commercial = 70 Construction Worker = 70
C_{sat}	Soil Saturation Concentration	mg/kg	Appendix A, Table A or Equation S29 in Appendix C, Table A	Chemical-Specific or Calculated Value
C_w	Target Soil Leachate Concentration	mg/L	Equation S18 in Appendix C, Table A	Groundwater Standard, Health Advisory concentration, or Calculated Value
d	Mixing Zone Depth	m	SSL or Equation S25 in Appendix C, Table A	2 m or Calculated Value
d_a	Aquifer Thickness	m	Field Measurement	Site-Specific

Symbol	Parameter	Units	Source	Parameter Value(s)
d_s	Depth of Source (Vertical thickness of contamination)	m	Field Measurement or Estimation	Site-Specific
D_A	Apparent Diffusivity	cm^2/s	Equation S10 in Appendix C, Table A	Calculated Value
D_i	Diffusivity in Air	cm^2/s	Appendix C, Table E	Chemical-Specific
D_w	Diffusivity in Water	cm^2/s	Appendix C, Table E	Chemical-Specific
DF	Dilution Factor	unitless	Equation S22 in Appendix C, Table A	20 or Calculated Value
ED	Exposure Duration for Ingestion of Carcinogens	yr		Industrial/Commercial = 25 Construction Worker = 1
ED	Exposure Duration for Inhalation of Carcinogens	yr		Residential = 30 Industrial/Commercial = 25 Construction Worker = 1
ED	Exposure Duration for Ingestion of Noncarcinogens	yr		Residential = 6 Industrial/Commercial = 25 Construction Worker = 1
ED	Exposure Duration for Inhalation of Noncarcinogens	yr		Residential = 30 Industrial/Commercial = 25 Construction Worker = 1
ED	Exposure Duration for the Direct Ingestion of Groundwater	yr		Residential = 30 Industrial/Commercial = 25 Construction Worker = 1
ED_{M-L}	Exposure Duration for Migration to Groundwater Mass-Limit Equation S28	yr	SSL	70

Symbol	Parameter	Units	Source	Parameter Value(s)
EF	Exposure Frequency	d/yr		Residential = 350 Industrial/Commercial = 250 Construction Worker = 30
F(x)	Function dependent on U_m/U_t	unitless	SSL	0.194
f_{oc}	Organic Carbon Content of Soil	g/g	SSL or Field Measurement (See Appendix C, Table F)	Surface Soil = 0.006 Subsurface soil = 0.002, or Site-Specific
GW_{obj}	Groundwater Remediation Remediation Objective	mg/L	Appendix B, Table E, 35 IAC 620.Subpart F, or Equation S23 in Appendix C, Table A	Chemical-Specific or Calculated
H'	Henry's Law Constant	unitless	Appendix C, Table E	Chemical-Specific
i	Hydraulic Gradient	m/m	Field Measurement (See Appendix C, Table F)	Site-Specific
I	Infiltration Rate	m/yr	SSL	0.3
I_{M-L}	Infiltration Rate for Migration to Groundwater Mass-Limit Equation S28	m/yr	SSL	0.18
$IF_{soil-adj}$ (residential)	Age Adjusted Soil Ingestion Factor for Carcinogens	(mg-yr)/(kg-d)	SSL	114
IR_{soil}	Soil Ingestion Rate	mg/d		Residential = 200 Industrial/Commercial = 50 Construction Worker = 480

Symbol	Parameter	Units	Source	Parameter Value(s)
IR_W	Daily Water Ingestion Rate	L/d		Residential = 2 Industrial/Commercial = 1
K	Aquifer Hydraulic Conductivity	m/yr	Field Measurement (See Appendix C, Table F)	Site-Specific
K_d (Non-ionizing organics)	Soil-Water Partition Coefficient	cm^3/g or L/kg	Equation S19 in Appendix C, Table A	Calculated Value
K_d (Ionizing organics)	Soil-Water Partition Coefficient	cm3/g or L/kg	Equation S19 in Appendix C, Table A	Chemical and pH-Specific (see Appendix C, Table I)
K_d (Inorganics)	Soil-Water Partition Coefficient	cm3/g or L/kg	Appendix C, Table J	Chemical and pH-Specific
K_{oc}	Organic Carbon Partition Coefficient	cm^3/g or L/kg	Appendix C, Table E or Appendix C, Table I	Chemical-Specific
K_s	Saturated Hydraulic Conductivity	m/yr	Appendix C, Table K Appendix C, Illustration C	Site-Specific
L	Source Length Parallel to Groundwater Flow	m	Field Measurement	Site-Specific
PEF	Particulate Emission Factor	m^3/kg	SSL or Equation S15 in Appendix C, Table A	Residential = $1.32 \bullet 10^9$ or Site-Specific Industrial/Commercial = $1.24 \bullet 10^9$ or Site-Specific
PEF′	Particulate Emission Factor adjusted for Agitation (construction worker)	m^3/kg	Equation S16 in Appendix C, Table A using PEF (industrial/commercial)	$1.24 \bullet 10^8$ or Site-Specific

Symbol	Parameter	Units	Source	Parameter Value(s)
Q/C (used in VF equations)	Inverse of the mean concentration at the center of a square source	$(g/m^2\text{-}s)/(kg/m^3)$	Appendix C, Table H	Residential = 68.81 Industrial/Commercial = 85.81 Construction Worker = 85.81
Q/C (used in PEF equations)	Inverse of the mean concentration at the center of a square source	$(g/m^2\text{-}s)/(kg/m^3)$	SSL or Appendix C, Table H	Residential = 90.80 Industrial/Commercial = 85.81 Construction Worker = 85.81
RfC	Inhalation Reference Concentration	mg/m^3	~~IEPA (IRIS/HEAST[a])~~ Illinois EPA	Toxicological-Specific (Note: for Construction Workers use subchronic reference concentrations)
RfD_o	Oral Reference Dose	mg/(kg-d)	~~IEPA (IRIS/HEAST[a])~~ Illinois EPA	Toxicological-Specific (Note: for Construction Worker use subchronic reference doses)
S	Solubility in Water	mg/L	Appendix C, Table E	Chemical-Specific
SF_o	Oral Slope Factor	$(mg/kg\text{-}d)^{-1}$	~~IEPA (IRIS/HEAST[a])~~ Illinois EPA	Toxicological-Specific
T	Exposure Interval	s		Residential = $9.5 \bullet 10^8$ Industrial/Commercial = $7.9 \bullet 10^8$ Construction Worker = $3.6 \bullet 10^6$
$T_{M\text{-}L}$	Exposure Interval for Mass-Limit Volatilization Factor Equation S26	yr	SSL	30
THQ	Target Hazard Quotient	unitless	SSL	1

Symbol	Parameter	Units	Source	Parameter Value(s)
TR	Target Cancer Risk	unitless		Residential = 10^{-6} at the point of human exposure Industrial/Commercial = 10^{-6} at the point of human exposure Construction Worker = 10^{-6} at the point of human exposure
U_m	Mean Annual Windspeed	m/s	SSL	4.69
URF	Inhalation Unit Risk Factor	$(ug/m^3)^{-1}$	~~IEPA (IRIS/HEAST[a])~~ Illinois EPA	Toxicological-Specific
U_t	Equivalent Threshold Value of Windspeed at 7 m	m/s	SSL	11.32
V	Fraction of Vegetative Cover	unitless	SSL or Field Measurement	0.5 or Site-Specific
VF	Volatilization Factor	m^3/kg	Equation S8 in Appendix C, Table A	Calculated Value
VF′	Volatilization Factor adjusted for Agitation	m^3/kg	Equation S9 in Appendix C, Table A	Calculated Value
VF_{M-L}	Mass-Limit Volatilization Factor	m^3/kg	Equation S26 in Appendix C, Table A	Calculated Value
VF'_{M-L}	Mass-Limit Volatilization Factor adjusted for Agitation	m^3/kg	Equation S27 in Appendix C, Table A	Calculated Value

Symbol	Parameter	Units	Source	Parameter Value(s)
η	Total Soil Porosity	L_{pore}/L_{soil}	SSL or Equation S24 in Appendix C, Table A	0.43, or Gravel = 0.25 Sand = 0.32 Silt = 0.40 Clay = 0.36, or Calculated Value
θ_a	Air-Filled Soil Porosity	L_{air}/L_{soil}	SSL or Equation S21 in Appendix C, Table A	Surface Soil (top 1 meter) = 0.28 Subsurface Soil (below 1 meter) = 0.13, or Gravel = 0.05 Sand = 0.14 Silt - 0.24 Clay = 0.19, or Calculated Value
θ_w	Water-Filled Soil Porosity	L_{water}/L_{soil}	SSL or Equation S20 in Appendix C, Table A	Surface Soil (top 1 meter) = 0.15 Subsurface Soil (below 1 meter) = 0.30, or Gravel = 0.20 Sand = 0.18 Silt = 0.16 Clay = 0.17, or Calculated Value

Symbol	Parameter	Units	Source	Parameter Value(s)
ρ_b	Dry Soil Bulk Density	kg/L or g/cm^3	SSL or Field Measurement (See Appendix C, Table F)	1.5, or Gravel = 2.0 Sand = 1.8 Silt = 1.6 Clay = 1.7, or Site-Specific
ρ_s	Soil Particle Density	g/cm^3	SSL or Field Measurement (See Appendix C, Table F)	2.65, or Site-Specific
ρ_w	Water Density	g/cm^3	SSL	1
1/(2b+3)	Exponential in Equation S20	unitless	Appendix C, Table K Appendix C, Illustration C	Site-Specific

a ~~HEAST = Health Effects Assessment Summary Tables~~. USEPA, Office of Solid Waste and Emergency Response. EPA/SQO/R-95/036. Updated Quarterly.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

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Section 742.APPENDIX C Tier 2 Illustrations and Tables

Section 742.Table D RBCA Parameters

Symbol	Parameter	Units	Source	Parameter Value(s)
AT_c	Averaging Time for Carcinogens	yr	RBCA	70
AT_n	Averaging Time for Noncarcinogens	yr	RBCA	Residential = 30 Industrial/Commercial = 25 Construction Worker = 0.115
BW	Adult Body Weight	kg	RBCA	70
C_{source}	The greatest potential concentration of the contaminant of concern in the groundwater at the source of the contamination, based on the concentrations of contaminants in groundwater due to the release and the projected concentration of the contaminant migrating from the soil to the groundwater.	mg/L	Field Measurement	Site-Specific
$C_{(x)}$	Concentration of Contaminant in Groundwater at Distance X from the source	mg/L	Equation R26 in Appendix C, Table C	Calculated Value
$C_{(x)}/C_{source}$	Steady-State Attenuation Along the Centerline of a Dissolved Plume	unitless	Equation R15 in Appendix C, Table C	Calculated Value
d	Lower Depth of Surficial Soil Zone	cm	Field Measurement	100 or Site-Specific (not to exceed 100)

Symbol	Parameter	Units	Source	Parameter Value(s)
D^{air}	Diffusion Coefficient in Air	cm^2/s	Appendix C, Table E	Chemical-Specific
D^{water}	Diffusion Coefficient in Water	cm^2/s	Appendix C, Table E	Chemical-Specific
D_s^{eff}	Effective Diffusion Coefficient in Soil Based on Vapor-Phase Concentration	cm^2/s	Equation R6 in Appendix C, Table C	Calculated Value
ED	Exposure Duration	yr	RBCA	Residential = 30 Industrial/Commercial = 25 Construction Worker = 1
EF	Exposure Frequency	d/yr	RBCA	Residential = 350 Industrial/Commercial = 250 Construction Worker = 30
erf	Error Function	unitless	Appendix C, Table G	Mathematical Function
f_{oc}	Organic Carbon Content of Soil	g/g	RBCA or Field Measurement (See Appendix C, Table F)	Surface Soil = 0.006 Subsurface Soil = 0.002 or Site-Specific
GW_{comp}	Groundwater Objective at the Compliance Point	mg/L	Appendix B, Table E, 35 IAC 620.Subpart F, or Equation R25 in Appendix C, Table C	Site-Specific
GW_{source}	Groundwater Concentration at the Source	mg/L	Equation R13 in Appendix C, Table C	Calculated Value

Symbol	Parameter	Units	Source	Parameter Value(s)
H'	Henry's Law Constant	cm^3_{water}/cm^3_{air}	Appendix C, Table E	Chemical-Specific
i	Hydraulic Gradient	cm/cm (unitless)	Field Measurement (See Appendix C, Table F)	Site-Specific
I	Infiltration Rate	cm/yr	RBCA	30
IR_{air}	Daily Outdoor Inhalation Rate	m^3/d	RBCA	20
IR_{soil}	Soil Ingestion Rate	mg/d	RBCA	Residential = 100 Industrial/Commercial = 50 Construction Worker = 480
IR_w	Daily Water Ingestion Rate	L/d	RBCA	Residential = 2 Industrial/Commercial = 1
K	Aquifer Hydraulic Conductivity	cm/d for Equations R15, R19 and R26 cm/yr for Equation R24	Field Measurement (See Appendix C, Table F)	Site-Specific
K_{oc}	Organic Carbon Partition Coefficient	cm^3/g or L/kg	Appendix C, Table E or Appendix C, Table I	Chemical-Specific
k_s (non-ionizing organics)	Soil Water Sorption Coefficient	cm^3_{water}/g_{soil}	Equation R20 in Appendix C,Table C	Calculated Value
k_s (ionizing organics)	Soil Water Sorption Coefficient	cm^3_{water}/g_{soil}	Equation R20 in Appendix C, Table C	Chemical and pH-Specific (See Appendix C, Table I)
k_s (inorganics)	Soil Water Sorption Coefficient	cm^3_{water}/g_{soil}	Appendix C, Table J	Chemical and pH-Specific

Symbol	Parameter	Units	Source	Parameter Value(s)
L_s	Depth to Subsurface Soil Sources	cm	RBCA	100
LF_{sw}	Leaching Factor	$(mg/L_{water})/(mg/kg_{soil})$	Equation R14 in Appendix C, Table C	Calculated Value
M	Soil to Skin Adherence Factor	mg/cm^2	RBCA	0.5
Pe	Particulate Emission Rate	g/cm^2-s	RBCA	$6.9 \bullet 10^{-14}$
RAF_d	Dermal Relative Absorption Factor	unitless	RBCA	0.5
RAF_d (PNAs)	Dermal Relative Absorption Factor	unitless	RBCA	0.05
RAF_d (inorganics)	Dermal Relative Absorption Factor	unitless	RBCA	0
RAF_o	Oral Relative Absorption Factor	unitless	RBCA	1.0
$RBSL_{air}$	Carcinogenic Risk-Based Screening Level for Air	ug/m^3	Equation R9 in Appendix C, Table C	Chemical-, Media-, and Exposure Route-Specific
$RBSL_{air}$	Noncarcinogenic Risk-Based Screening Level for Air	ug/m^3	Equations R10 in Appendix C, Table C	Chemical-, Media-, and Exposure Route-Specific
RfD_i	Inhalation Reference Dose	mg/kg-d	~~IEPA (IRIS/HEAST[a])~~ Illinois EPA	Toxicological-Specific

Symbol	Parameter	Units	Source	Parameter Value(s)
RfD_o	Oral Reference Dose	mg/(kg-d)	~~IEPA (IRIS/HEAST[a])~~ Illinois EPA	Toxicological-Specific (Note: for Construction Worker use subchronic reference doses)
SA	Skin Surface Area	cm^2/d	RBCA	3,160
Symbol	Parameter	Units	Source	Parameter Value(s)
S_d	Source Width Perpendicular to Groundwater Flow Direction in Vertical Plane	cm	Field Measurement	For Migration to Groundwater Route: Use 200 or Site-Specific For Groundwater remediation objective: Use Site-Specific
S_w	Source Width Perpendicular to Groundwater Flow Direction in Horizontal Plane	cm	Field Measurement	Site-Specific
SF_i	Inhalation Cancer Slope Factor	$(mg/kg-d)^{-1}$	~~IEPA (IRIS/HEAST[a])~~ Illinois EPA	Toxicological-Specific
SF_o	Oral Slope Factor	$(mg/kg-d)^{-1}$	~~IEPA (IRIS/HEAST[a])~~ Illinois EPA	Toxicological-Specific
THQ	Target Hazard Quotient	unitless	RBCA	1

Symbol	Parameter	Units	Source	Parameter Value(s)
TR	Target Cancer Risk	unitless	RBCA	Residential = 10^{-6} at the point of human exposure Industrial/Commercial = 10^{-6} at the point of human exposure Construction Worker = 10^{-6} at the point of human exposure
U	Specific Discharge	cm/d	Equation R19 in Appendix C, Table C	Calculated Value
Symbol	Parameter	Units	Source	Parameter Value(s)
U_{air}	Average Wind Speed Above Ground Surface in Ambient Mixing Zone	cm/s	RBCA	225
U_{gw}	Groundwater Darcy Velocity	cm/yr	Equation R24 in Appendix C, Table C	Calculated Value
VF_p	Volatilization Factor for Surficial Soils Regarding Particulates	kg/m^3	Equation R5 in Appendix C, Table C	Calculated Value
VF_{samb}	Volatilization Factor (Subsurface Soils to Ambient Air)	$(mg/m^3_{air})/(mg/kg_{soil})$ or kg/m^3	Equation R11 in Appendix C, Table C	Calculated Value
VF_{ss}	Volatilization Factor for Surficial Soils	kg/m^3	Use Equations R3 and R4 in Appendix C, Table C	Calculated Value from Equation R3 or R4 (whichever is less)
W	Width of Source Area Parallel to Direction to Wind or Groundwater Movement	cm	Field Measurement	Site-Specific

Symbol	Parameter	Units	Source	Parameter Value(s)
w	Average Soil Moisture Content	g_{water}/g_{soil}	RBCA or Field Measurement (See Appendix C, Table F)	0.1, or Surface Soil (top 1 meter) = 0.1 Subsurface Soil (below 1 meter) = 0.2, or Site-Specific
X	Distance along the Centerline of the Groundwater Plume Emanating from a Source. The x direction is the direction of groundwater flow	cm	Field Measurement	Site-Specific
α_x	Longitudinal Dispersitivity	cm	Equation R16 in Appendix C, Table C	Calculated Value
α_y	Transverse Dispersitivity	cm	Equation R17 in Appendix C, Table C	Calculated Value
α_z	Vertical Dispersitivity	cm	Equation R18 in Appendix C, Table C	Calculated Value
δ_{air}	Ambient Air Mixing Zone Height	cm	RBCA	200
δ_{gw}	Groundwater Mixing Zone Thickness	cm	RBCA	200

Symbol	Parameter	Units	Source	Parameter Value(s)
θ_{as}	Volumetric Air Content in Vadose Zone Soils	cm^3_{air}/cm^3_{soil}	RBCA or Equation R21 in Appendix C, Table C	Surface Soil (top 1 meter) = 0.28 Subsurface Soil (below 1 meter)= 0.13, Or Gravel = 0.05 Sand = 0.14 Silt = 0.16 Clay = 0.17, or Calculated Value
θ_{ws}	Volumetric Water Content in Vadose Zone Soils	cm^3_{water}/cm^3_{soil}	RBCA or Equation R22 in Appendix C, Table C	Surface Soil (top 1 meter) = 0.15 Subsurface Soil (below 1 meter) = 0.30, or Gravel = 0.20 Sand = 0.18 Silt = 0.16 Clay = 0.17, or Calculated Value
θ_T	Total Soil Porosity	cm^3/cm^3_{soil}	RBCA or Equation R23 in Appendix C, Table C	0.43, or Gravel = 0.25 Sand = 0.32 Silt = 0.40 Clay = 0.36, or Calculated Value
λ	First Order Degradation Constant	d^{-1}	Appendix C, Table E	Chemical-Specific

Symbol	Parameter	Units	Source	Parameter Value(s)
π	pi			3.1416
ρ_b	Soil Bulk Density	g/cm^3	RBCA or Field Measurement (See Appendix C, Table F)	1.5, or Gravel = 2.0 Sand = 1.8 Silt = 1.6 Clay = 1.7, or Site-Specific
ρ_w	Water Density	g/cm^3	RBCA	1
τ	Averaging Time for Vapor Flux	s	RBCA	$9.46 \bullet 10^8$

[a] ~~HEAST = Health Effects Assessment Summary Tables.~~ USEPA, Office of Solid Waste and Emergency Response. EPA/540/R-95/036. Updated Quarterly.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX C: Tier 2 Illustrations and Tables

Section 742.Table E: Default Physical and Chemical Parameters

~~CAS No.~~	~~Chemical~~	~~Solubility in Water (S) (mg/L)~~	~~Diffusivity in Air (Di) (cm^2/s)~~	~~Diffusivity in Water (D_w) (cm^2/s)~~	~~Dimensionless Henry's Law Constant (H') (25°C)~~	~~Organic Carbon Partition Coefficient (K_{oc}) (L/kg)~~	~~First Order Degradation Constant (λ) (d^{-1})~~
~~Neutral Organics~~							
~~83-32-9~~	~~Acenaphthene~~	~~4.24~~	~~0.0421~~	~~7.69E-6~~	~~0.00636~~	~~7,080~~	~~0.0034~~
~~67-64-1~~	~~Acetone~~	~~1,000,000~~	~~0.124~~	~~1.14E-5~~	~~0.00159~~	~~0.575~~	~~0.0495~~
~~15972-60-8~~	~~Alachlor~~	~~242~~	~~0.0198~~	~~5.69E-6~~	~~0.00000132~~	~~394~~	~~No Data~~
~~116-06-3~~	~~Aldicarb~~	~~6,000~~	~~0.0305~~	~~7.19E-6~~	~~0.0000000574~~	~~12~~	~~0.00109~~
~~309-00-2~~	~~Aldrin~~	~~0.18~~	~~0.0132~~	~~4.86E-6~~	~~0.00697~~	~~2,450,000~~	~~0.00059~~
~~120-12-7~~	~~Anthracene~~	~~0.0434~~	~~0.0324~~	~~7.74E-6~~	~~0.00267~~	~~29,500~~	~~0.00075~~
~~1912-24-9~~	~~Atrazine~~	~~70~~	~~0.0258~~	~~6.69E-6~~	~~0.00000005~~	~~451~~	~~No Data~~
~~71-43-2~~	~~Benzene~~	~~1,750~~	~~0.088~~	~~9.80E-6~~	~~0.228~~	~~58.9~~	~~0.0009~~

~~CAS No.~~	~~Chemical~~	~~Solubility in Water (S) (mg/L)~~	~~Diffusivity in Air (Di) (cm^2/s)~~	~~Diffusivity in Water (D_w) (cm^2/s)~~	~~Dimensionless Henry's Law Constant (H') (25°C)~~	~~Organic Carbon Partition Coefficient (K_{oc}) (L/kg)~~	~~First Order Degradation Constant (λ_1) (d^{-1})~~
~~56-55-3~~	~~Benzo(a)anthracene~~	~~0.0094~~	~~0.0510~~	~~9.00E-6~~	~~0.000137~~	~~398,000~~	~~0.00051~~
~~205-99-2~~	~~Benzo(b)fluoranthene~~	~~0.0015~~	~~0.0226~~	~~5.56E-6~~	~~0.00455~~	~~1,230,000~~	~~0.00057~~
~~207-08-9~~	~~Benzo(k)fluoranthene~~	~~0.0008~~	~~0.0226~~	~~5.56E-6~~	~~0.000034~~	~~1,230,000~~	~~0.00016~~
~~65-85-0~~	~~Benzoic Acid~~	~~3,500~~	~~0.0536~~	~~7.97E-6~~	~~0.0000631~~	~~0.600~~	~~No Data~~
~~50-32-8~~	~~Benzo(a)pyrene~~	~~0.00162~~	~~0.043~~	~~9.00E-6~~	~~0.0000463~~	~~1,020,000~~	~~0.00065~~
~~111-44-4~~	~~Bis(2-chloroethyl)ether~~	~~17,200~~	~~0.0692~~	~~7.53E-6~~	~~0.000738~~	~~15.5~~	~~0.0019~~
~~117-81-7~~	~~Bis(2-ethylhexyl)phthalate~~	~~0.34~~	~~0.0351~~	~~3.66E-6~~	~~0.00000418~~	~~15,100,000~~	~~0.0018~~
~~75-27-4~~	~~Bromodichloromethane~~	~~6,740~~	~~0.0298~~	~~1.06E-5~~	~~0.0656~~	~~55.0~~	~~No Data~~
~~75-25-2~~	~~Bromoform~~	~~3,100~~	~~0.0149~~	~~1.03E-5~~	~~0.0219~~	~~87.1~~	~~0.0019~~
~~71-36-3~~	~~Butanol~~	~~74,000~~	~~0.0800~~	~~9.30E-6~~	~~0.000361~~	~~6.92~~	~~0.01283~~
~~85-68-7~~	~~Butyl Benzyl Phthalate~~	~~2.69~~	~~0.0174~~	~~4.83E-6~~	~~0.0000517~~	~~57,500~~	~~0.00385~~
~~86-74-8~~	~~Carbazole~~	~~7.48~~	~~0.0390~~	~~7.03E-6~~	~~0.000000626~~	~~3,390~~	~~No Data~~

CAS No.	Chemical	Solubility in Water (S) (mg/L)	Diffusivity in Air (Di) (cm^2/s)	Diffusivity in Water (D_w) (cm^2/s)	Dimensionless Henry's Law Constant (H') (25°C)	Organic Carbon Partition Coefficient (K_{oc}) (L/kg)	First Order Degradation Constant (λ) (d^{-1})
1563-66-2	Carbofuran	320	0.0249	6.63E-6	.00377	37	No Data
75-15-0	Carbon Disulfide	1,190	0.104	1.00E-5	1.24	45.7	No Data
56-23-5	Carbon Tetrachloride	793	0.0780	8.80E-6	1.25	174	0.0019
57-74-9	Chlordane	0.056	0.0118	4.37E-6	0.00199	120,000	0.00025
106-47-8	p-Chloroaniline	5,300	0.0483	1.01E-5	0.0000136	66.1	No Data
108-90-7	Chlorobenzene	472	0.0730	8.70E-6	0.152	219	0.0023
124-48-1	Chlorodibromomethane	2,600	0.0196	1.05E-5	0.0321	63.1	0.00385
67-66-3	Chloroform	7,920	0.104	1.00E-5	0.15	39.8	0.00039
95-57-8	2-Chlorophenol	22,000	0.0501	9.46E-6	0.016	388	No Data
218-01-9	Chrysene	0.0016	0.0248	6.21E-6	0.00388	398,000	0.00035
94-75-7	2,4-D	680	0.0231	7.31E-6	0.00000041	451	0.00385
72-54-8	4,4'-DDD	0.09	0.0169	4.76E-6	0.000164	1,000,000	0.000062

~~CAS No.~~	~~Chemical~~	~~Solubility in Water (S) (mg/L)~~	~~Diffusivity in Air (Di) (cm^2/s)~~	~~Diffusivity in Water (D_w) (cm^2/s)~~	~~Dimensionless Henry's Law Constant (H') (25°C)~~	~~Organic Carbon Partition Coefficient (K_{oc}) (L/kg)~~	~~First Order Degradation Constant (λ) (d^{-1})~~
~~72-55-9~~	~~4,4' DDE~~	~~0.12~~	~~0.0144~~	~~5.87E-6~~	~~0.000861~~	~~4,470,000~~	~~0.000062~~
~~50-29-3~~	~~4,4' DDT~~	~~0.025~~	~~0.0137~~	~~4.95E-6~~	~~0.000332~~	~~2,630,000~~	~~0.000062~~
~~75-99-0~~	~~Dalapon~~	~~900,000~~	~~0.0414~~	~~9.46E-6~~	~~0.00000264~~	~~5.8~~	~~0.005775~~
~~53-70-3~~	~~Dibenzo(a,h)anthracene~~	~~0.00249~~	~~0.0202~~	~~5.18E-6~~	~~0.000000603~~	~~3,800,000~~	~~0.00037~~
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1,200~~	~~0.0212~~	~~7.02E-6~~	~~0.00615~~	~~182~~	~~0.001925~~
~~106-93-4~~	~~1,2-Dibromoethane~~	~~4,200~~	~~0.0287~~	~~8.06E-6~~	~~0.0303~~	~~93~~	~~0.005775~~
~~84-74-2~~	~~Di-n-butyl Phthalate~~	~~11.2~~	~~0.0438~~	~~7.86E-6~~	~~0.0000000385~~	~~33,900~~	~~0.03013~~
~~95-50-1~~	~~1,2-Dichlorobenzene~~	~~156~~	~~0.0690~~	~~7.90E-6~~	~~0.0779~~	~~617~~	~~0.0019~~
~~106-46-7~~	~~1,4-Dichlorobenzene~~	~~73.8~~	~~0.0690~~	~~7.90E-6~~	~~0.0996~~	~~617~~	~~0.0019~~
~~91-94-1~~	~~3,3-Dichlorobenzidine~~	~~3.11~~	~~0.0194~~	~~6.74E-6~~	~~0.000000164~~	~~724~~	~~0.0019~~

CAS No.	Chemical	Solubility in Water (S) (mg/L)	Diffusivity in Air (Di) (cm^2/s)	Diffusivity in Water (D_w) (cm^2/s)	Dimensionless Henry's Law Constant (H') (25°C)	Organic Carbon Partition Coefficient (K_{oc}) (L/kg)	First Order Degradation Constant (λ) (d^{-1})
75-34-3	1,1-Dichloroethane	5,060	0.0742	1.05E-5	0.23	31.6	0.0019
107-06-2	1,2-Dichloroethane	8,520	0.104	9.90E-6	0.0401	17.4	0.0019
75-35-4	1,1-Dichloroethylene	2,250	0.0900	1.04E-5	1.07	58.9	0.0053
156-59-2	Cis-1,2-Dichloroethylene	3,500	0.0736	1.13E-5	0.167	35.5	0.00024
156-60-5	Trans-1,2-Dichloroethylene	6,300	0.0707	1.19E-5	0.385	52.5	0.00024
120-83-2	2,4-Dichlorophenol	4,500	0.0346	8.77E-6	0.00013	147	0.00027
78-87-5	1,2-Dichloropropane	2,800	0.0782	8.73E-6	0.115	43.7	0.00027
542-75-6	1,3-Dichloropropylene (cis + trans)	2,800	0.0626	1.00E-5	0.726	45.7	0.061
60-57-1	Dieldrin	0.195	0.0125	4.74E-6	0.000619	21,400	0.00032
84-66-2	Diethyl Phthalate	1,080	0.0256	6.35E-6	0.0000185	288	0.00619
105-67-9	2,4-Dimethylphenol	7,870	0.0584	8.69E-6	0.000082	209	0.0495
51-28-5	2,4-Dinitrophenol	2,790	0.0273	9.06E-6	0.0000182	0.01	0.00132

~~CAS No.~~	~~Chemical~~	~~Solubility in Water (S) (mg/L)~~	~~Diffusivity in Air (Di) (cm^2/s)~~	~~Diffusivity in Water (D_w) (cm^2/s)~~	~~Dimensionless Henry's Law Constant (H') (25°C)~~	~~Organic Carbon Partition Coefficient (K_{oc}) (L/kg)~~	~~First Order Degradation Constant (λ) (d^{-1})~~
~~121-14-2~~	~~2,4-Dinitrotoluene~~	~~270~~	~~0.203~~	~~7.06E-6~~	~~0.0000038~~	~~95.5~~	~~0.00192~~
~~606-20-2~~	~~2,6-Dinitrotoluene~~	~~182~~	~~0.0327~~	~~7.26E-6~~	~~0.0000306~~	~~69.2~~	~~0.00192~~
~~88-85-7~~	~~Dinoseb~~	~~52~~	~~0.0215~~	~~6.62E-6~~	~~0.0000189~~	~~1,120~~	~~0.002817~~
~~117-84-0~~	~~Di-n-octyl Phthalate~~	~~0.02~~	~~0.0151~~	~~3.58E-6~~	~~0.00274~~	~~83,200,000~~	~~0.0019~~
~~115-29-7~~	~~Endosulfan~~	~~0.51~~	~~0.0115~~	~~4.55E-6~~	~~0.000459~~	~~2,140~~	~~0.07629~~
~~145-73-3~~	~~Endothall~~	~~21,000~~	~~0.0291~~	~~8.07E-6~~	~~0.0000000107~~	~~0.29~~	~~No Data~~
~~72-20-8~~	~~Endrin~~	~~0.25~~	~~0.0125~~	~~4.74E-6~~	~~0.000308~~	~~12,300~~	~~0.00032~~
~~100-41-4~~	~~Ethylbenzene~~	~~169~~	~~0.0750~~	~~7.80E-6~~	~~0.323~~	~~363~~	~~0.003~~
~~206-44-0~~	~~Fluoranthene~~	~~0.206~~	~~0.0302~~	~~6.35E-6~~	~~0.00066~~	~~107,000~~	~~0.00019~~
~~86-73-7~~	~~Fluorene~~	~~1.98~~	~~0.0363~~	~~7.88E-6~~	~~0.00261~~	~~13,800~~	~~0.000691~~
~~76-44-8~~	~~Heptachlor~~	~~0.18~~	~~0.0112~~	~~5.69E-6~~	~~60.7~~	~~1,410,000~~	~~0.13~~
~~1024-57-3~~	~~Heptachlor epoxide~~	~~0.2~~	~~0.0132~~	~~4.23E-6~~	~~0.00039~~	~~83,200~~	~~0.00063~~

CAS No.	Chemical	Solubility in Water (S) (mg/L)	Diffusivity in Air (Di) (cm^2/s)	Diffusivity in Water (D_w) (cm^2/s)	Dimensionless Henry's Law Constant (H') (25°C)	Organic Carbon Partition Coefficient (K_{oc}) (L/kg)	First Order Degradation Constant (λ_i) (d^{-1})
118-74-1	Hexachlorobenzene	6.2	0.0542	5.91E-6	0.0541	55,000	0.00017
319-84-6	Alpha-HCH (alpha-BHC)	2.0	0.0142	7.34E-6	0.000435	1,230	0.0025
58-89-9	Gamma-HCH (Lindane)	6.8	0.0142	7.34E-6	0.000574	1,070	0.0029
77-47-4	Hexachlorocyclo-Pentadiene	1.8	0.0161	7.21E-6	1.11	200,000	0.012
67-72-1	Hexachloroethane	50	0.0025	6.80E-6	0.159	1,780	0.00192
193-39-5	Indeno(1,2,3-c,d)pyrene	0.000022	0.0190	5.66E-6	0.0000656	3,470,000	0.00047
78-59-1	Isophorone	12,000	0.0623	6.76E-6	0.000272	46.8	0.01238
7439-97-6	Mercury	—	0.0307	6.30E-6	0.467	—	No Data
72-43-5	Methoxychlor	0.045	0.0156	4.46E-6	0.000648	97,700	0.0019
74-83-9	Methyl Bromide	15,200	0.0728	1.21E-5	0.256	10.5	0.01824
1634-04-4	Methyl tertiary-butyl ether	51,000	0.102	1.10E-5	0.0241	11.5	No Data
75-09-2	Methylene Chloride	13,000	0.101	1.17E-5	0.0898	11.7	0.012

CAS No.	Chemical	Solubility in Water (S) (mg/L)	Diffusivity in Air (Di) (cm^2/s)	Diffusivity in Water (D_w) (cm^2/s)	Dimensionless Henry's Law Constant (H') (25°C)	Organic Carbon Partition Coefficient (K_{oc}) (L/kg)	First Order Degradation Constant (λ_1) (d^{-1})
95-48-7	2-Methylphenol (o-cresol)	26,000	0.0740	8.30E-6	0.0000492	91.2	0.0495
91-20-3	Naphthalene	31.0	0.0590	7.50E-6	0.0198	2,000	0.0027
98-95-3	Nitrobenzene	2,090	0.0760	8.60E-6	0.000984	64.6	0.00176
86-30-6	N-Nitrosodiphenylamine	35.1	0.0312	6.35E-6	0.000205	1,290	0.01
621-64-7	N-Nitrosodi-n-propylamine	9,890	0.0545	8.17E-6	0.0000923	24.0	0.0019
87-86-5	Pentachlorophenol	1,950	0.0560	6.10E-6	0.000001	592	0.00045
108-95-2	Phenol	82,800	0.0820	9.10E-6	0.0000163	28.8	0.099
1918-02-1	Picloram	430	0.0255	5.28E-6	0.00000000166	1.98	No Data
1336-36-3	Polychlorinated biphenyls (PCBs)	0.7	——[a]	——[a]	——[a]	309,000	No Data
129-00-0	Pyrene	0.135	0.0272	7.24E-6	0.000451	105,000	0.00018
122-34-9	Simazine	5	0.027	7.36E-6	0.0000000133	133	No Data
100-42-5	Styrene	310	0.0710	8.00E-6	0.113	776	0.0033

CAS No.	Chemical	Solubility in Water (S) (mg/L)	Diffusivity in Air (Di) (cm^2/s)	Diffusivity in Water (D_w) (cm^2/s)	Dimensionless Henry's Law Constant (H') (25°C)	Organic Carbon Partition Coefficient (K_{oc}) (L/kg)	First Order Degradation Constant (λ) (d^{-1})
93-72-1	2,4,5-TP (Silvex)	31	0.0194	5.83E-6	0.0000000032	5,440	No Data
127-18-4	Tetrachloroethylene	200	0.0720	8.20E-6	0.754	155	0.00096
108-88-3	Toluene	526	0.0870	8.60E-6	0.272	182	0.011
8001-35-2	Toxaphene	0.74	0.0116	4.34E-6	0.000246	257,000	No Data
120-82-1	1,2,4-Trichlorobenzene	300	0.0300	8.23E-6	0.0582	1,780	0.0019
71-55-6	1,1,1-Trichloroethane	1,330	0.0780	8.80E-6	0.705	110	0.0013
79-00-5	1,1,2-Trichloroethane	4,420	0.0780	8.80E-6	0.0374	50.1	0.00095
79-01-6	Trichloroethylene	1,100	0.0790	9.10E-6	0.422	166	0.00042
95-95-4	2,4,5-Trichlorophenol	1,200	0.0291	7.03E-6	0.000178	1,600	0.00038
88-06-2	2,4,6-Trichlorophenol	800	0.0318	6.25E-6	0.000319	381	0.00038
108-05-4	Vinyl Acetate	20,000	0.0850	9.20E-6	0.021	5.25	No Data
57-01-4	Vinyl Chloride	2,760	0.106	1.23E-6	1.11	18.6	0.00024
108-38-3	m-Xylene	161	0.070	7.80E-6	0.301	407	0.0019

~~CAS No.~~	~~Chemical~~	~~Solubility in Water (S) (mg/L)~~	~~Diffusivity in Air (Di) (cm^2/s)~~	~~Diffusivity in Water (D_w) (cm^2/s)~~	~~Dimensionless Henry's Law Constant (H') (25°C)~~	~~Organic Carbon Partition Coefficient (K_{oc}) (L/kg)~~	~~First Order Degradation Constant (λ) (d^{-1})~~
~~95-47-6~~	~~o-Xylene~~	~~178~~	~~0.087~~	~~1.00E-5~~	~~0.213~~	~~363~~	~~0.0019~~
~~106-42-3~~	~~p-Xylene~~	~~185~~	~~0.0769~~	~~8.44E-6~~	~~0.314~~	~~389~~	~~0.0019~~
~~1330-20-7~~	~~Xylenes (total)~~	~~186~~	~~0.0720~~	~~9.34E-6~~	~~0.25~~	~~260~~	~~0.0019~~

~~Chemical Abstracts Service (CAS) registry number. This number in the format xxx-xx-x, is unique for each chemical and allows efficient searching on computerized data bases.~~

~~[a] Soil Remediation objectives are determined pursuant to 40 CFR 761, as incorporated by reference at Section 732.104 (the USEPA "PCB Spill Cleanup Policy"), for most sites; persons remediating sites should consult with BOL if calculation of Tier 2 soil remediation objectives is desired.~~

(Source: Amended at ____ Ill. Reg. _____, effective _____)

CAS No.	Chemical	Solubility in Water (S) (mg/L)	Diffusivity in Air (Di) (cm^2/s)	Diffusivity in Water (D_w) (cm^2/s)	Dimensionless Henry's Law Constant (H') (25°C)	Dimensionless Henry's Law Constant (H') (13°C) For the indoor inhalation exposure route	Organic Carbon Partition Coefficient (K_{oc}) (L/kg)	First Order Degradation Constant (λ) (d^{-1})	Vapor Pressure (mm/Hg)
Neutral Organics									
83-32-9	Acenaphthene	3.60E+00	4.76E-02	7.69E-06	6.60E-03	--------[b]	6.30E+03	3.40E-03	2.50E-03
67-64-1	Acetone	1.00E+06	1.24E-01	1.14E-05	1.60E-03	9.73E-04	7.80E-01	4.95E-02	2.30E+02
15972-60-8	Alachlor	2.40E+02	2.13E-02	5.28E-06	3.40E-06	--------[b]	3.20E+03	No Data	2.20E-05
116-06-3	Aldicarb	6.03E+03	3.18E-02	7.24E-06	5.90E-08	--------[b]	1.29E+01	1.09E-03	3.47E-05
309-00-2	Aldrin	1.70E-02	1.96E-02	4.86E-06	7.00E-03	--------[b]	2.50E+05	5.90E-04	6.00E-06
120-12-7	Anthracene	4.30E-02	3.85E-02	7.74E-06	2.70E-03	--------[b]	2.50E+04	7.50E-04	2.70E-06
1912-24-9	Atrazine	7.00E+01	2.59E-02	6.67E-06	9.68E-08	--------[b]	3.63E+02	No Data	2.70E-07
71-43-2	Benzene	1.80E+03	8.80E-02	1.02E-05	2.30E-01	1.34E-01	5.00E+01	9.00E-04	9.50E+01
56-55-3	Benzo(a)anthracene	9.40E-03	5.10E-02	9.00E-06	1.39E-04	--------[b]	4.00E+05	5.10E-04	1.10E-07
205-99-2	Benzo(b)fluoranthene	1.50E-03	2.23E-02	5.56E-06	4.55E-03	--------[b]	1.05E+06	5.70E-04	5.00E-07
207-08-9	Benzo(k)fluoranthene	8.00E-04	2.23E-02	5.56E-06	3.40E-05	--------[b]	1.00E+06	1.60E-04	2.00E-09
65-85-0	Benzoic Acid	3.40E+03	7.02E-02	7.97E-06	1.56E-06	--------[b]	1.21E+00[d]	No Data	7.00E-04

CAS No.	Chemical	Solubility in Water (S) (mg/L)	Diffusivity in Air (Di) (cm^2/s)	Diffusivity in Water (D_w) (cm^2/s)	Dimensionless Henry's Law Constant (H') (25°C)	Dimensionless Henry's Law Constant (H') (13°C) For the indoor inhalation exposure route	Organic Carbon Partition Coefficient (K_{oc}) (L/kg)	First Order Degradation Constant (λ) (d^{-1})	Vapor Pressure (mm/Hg)
50-32-8	Benzo(a)pyrene	1.60E-03	4.30E-02	9.49E-06	4.50E-05	-------[b]	7.90E+05	6.50E-04	5.50E-09
111-44-4	Bis(2-chloroethyl)ether	1.72E+04	4.13E-02	7.53E-06	7.40E-04	2.94E-04	1.26E+01	1.90E-03	1.55E+00
117-81-7	Bis(2-ethylhexyl)phthalate	3.40E-01	3.51E-02	3.66E-06	4.10E-06	-------[b]	1.00E+05	1.80E-03	6.80E-08
75-27-4	Bromodichloromethane	6.70E+03	5.61E-02	1.06E-05	6.60E-02	3.71E-02	5.00E+01	No Data	5.00E+01
75-25-2	Bromoform	3.10E+03	1.49E-02	1.03E-05	2.19E-02	1.06E-02	9.12E+01	1.90E-03	5.51E+00
71-36-3	Butanol	7.40E+04	8.00E-02	9.30E-06	3.61E-04	1.55E-04	6.00E+00	1.28E-02	7.00E+00
78-93-3	2-Butanone (MEK)	2.20E+05	8.08E-02	9.8E-06	2.30E-03	1.32E-03	2.00E+00	4.95E-02	9.50E+01
85-68-7	Butyl Benzyl Phthalate	2.70E+00	1.99E-02	4.89E-06	5.30E-05	-------[b]	6.30E+04	3.85E-03	8.30E-06
86-74-8	Carbazole	1.20E+00	4.17E-02	7.45E-06	3.60E-06	-------[b]	4.00E+03	No Data	7.00E-04
1563-66-2	Carbofuran	3.20E+02	2.37E-02	5.95E-06	1.27E-07	-------[b]	1.91E+02	No Data	4.85E-06
75-15-0	Carbon Disulfide	1.20E+03	1.04E-01	1.00E-05	1.23E+00	8.06E-01	6.30E+01	No Data	3.60E+02
56-23-5	Carbon Tetrachloride	7.90E+02	7.80E-02	8.80E-06	1.23E+00	7.48E-01	2.00E+02	1.90E-03	1.20E+02
57-74-9	Chlordane	5.60E-02	1.79E-02	4.37E-06	2.00E-03	-------[b]	2.50E+05	2.50E-04	9.80E-06

CAS No.	Chemical	Solubility in Water (S) (mg/L)	Diffusivity in Air (Di) (cm^2/s)	Diffusivity in Water (D_w) (cm^2/s)	Dimensionless Henry's Law Constant (H') (25°C)	Dimensionless Henry's Law Constant (H') (13°C) For the indoor inhalation exposure route	Organic Carbon Partition Coefficient (K_{oc}) (L/kg)	First Order Degradation Constant (λ) (d^{-1})	Vapor Pressure (mm/Hg)
106-47-8	p-Chloroaniline	5.30E+03	6.99E-02	1.01E-05	4.76E-05	--------[b]	6.31E+01	No Data	1.23E-02
108-90-7	Chlorobenzene	4.70E+02	7.30E-02	8.70E-06	1.50E-01	7.93E-02	2.00E+02	2.30E-03	1.20E+01
124-48-1	Chlorodibromomethane	2.60E+03	3.66E-02	1.05E-05	3.20E-02	2.07E-02	6.92E+01	3.85E-03	4.90E+00
67-66-3	Chloroform	7.90E+03	1.04E-01	1.00E-05	1.50E-01	9.18E-02	5.00E+01	3.90E-04	2.00E+02
95-57-8	2-Chlorophenol	2.20E+05	6.61E-02	9.46E-06	1.60E-02	7.28E-03	5.93E+01[d]	No Data	2.34E+00
218-01-9	Chrysene	6.30E-03	2.44E-02	6.21E-06	3.90E-03	--------[b]	4.00E+05	3.50E-04	6.20E-09
94-75-7	2,4-D	6.77E+02	5.88E-02	6.49E-06	4.18E-07	--------[b]	5.75E+02	3.85E-03	6.00E-07
72-54-8	4,4'-DDD	9.00E-02	2.27E-02	5.79E-06	1.60E-04	--------[b]	7.90E+05	6.20E-05	6.70E-07
72-55-9	4,4'-DDE	1.20E-01	2.38E-02	5.87E-06	8.60E-04	--------[b]	4.00E+05	6.20E-05	6.00E-06
50-29-3	4,4'-DDT	2.50E-02	1.99E-02	4.95E-06	3.30E-04	--------[b]	2.00E+06	6.20E-05	1.60E-07
75-99-0	Dalapon	9.00E+05	6.08E-02	9.45E-06	2.64E-06	NA	4.80E+00	5.78E-03	1.90E-01
53-70-3	Dibenzo(a,h)anthracene	2.50E-03	2.11E-02	5.24E-06	6.10E-07	--------[b]	2.50E+06	3.70E-04	1.00E-10
96-12-8	1,2-Dibromo-3-chloropropane	1.20E+03	2.68E-02	7.02E-06	6.20E-03[c]	NA	7.90E+01	1.93E-03	5.80E-01

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106-93-4	1,2-Dibromoethane	4.00E+03	4.37E-02	8.44E-06	3.00E-02	1.54E-02	5.00E+01	5.78E-03	1.30E+01
84-74-2	Di-n-butyl Phthalate	1.10E+01	4.38E-02	7.86E-06	7.40E-05	-------[b]	4.00E+04	3.01E-02	7.30E-05
1918-00-9	Dicamba	4.50E+03	2.37E-02	5.95E-06	2.18E-09	-------[b]	2.95E+00	No Data	3.38E-05
95-50-1	1,2-Dichlorobenzene	1.56E+02	6.90E-02	7.90E-06	7.79E-02	3.56E-02	5.75E+02	1.90E-03	1.36E+00
106-46-7	1,4-Dichlorobenzene	7.90E+01	6.90E-02	7.90E-06	9.80E-02	4.69E-02	7.90E+02	1.90E-03	1.00E+00
91-94-1	3,3-Dichlorobenzidine	3.10E+00	2.59E-02	6.74E-06	1.60E-07	-------[b]	2.82E+03	1.90E-03	3.71E-08
75-71-8	Dichlorodifluoromethane	2.80E+02	7.60E-02	1.08E-05	1.41E+01	8.14E+00	6.17E+01	1.92E-03	4.85E+03
75-34-3	1,1-Dichloroethane	5.10E+03	7.42E-02	1.05E-05	2.30E-01	1.42E-01	3.20E+01	1.90E-03	2.30E+02
107-06-2	1,2-Dichloroethane	8.50E+03	1.04E-02	9.90E-06	4.00E-02	2.29E-02	2.00E+01	1.90E-03	7.90E+01
75-35-4	1,1-Dichloroethylene	2.30E+03	9.00E-02	1.04E-05	1.10E+00	7.10E-01	5.00E+01	5.30E-03	6.00E+02
156-59-2	Cis-1,2-Dichloroethylene	3.50E+03	8.86E-02	1.13E-05	1.70E-01	1.00E-01	4.00E+01	2.40E-04	2.00E+02
156-60-5	Trans-1,2-Dichloroethylene	6.30E+03	7.03E-02	1.19E-05	3.90E-01	2.43E-01	5.00E+01	2.40E-04	3.30E+02
120-83-2	2,4-Dichlorophenol	4.50E+03	4.89E-02	8.77E-06	1.30E-04	-------[b]	7.32E+02[d]	2.70E-04	6.70E-02

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78-87-5	1,2-Dichloropropane	2.80E+03	7.82E-02	8.73E-06	1.10E-01	6.52E-02	5.00E+01	2.70E-04	5.20E+01
542-75-6	1,3-Dichloropropylene (cis + trans)	2.80E+03	6.26E-02	1.00E-05	7.40E-01	3.98E-01	2.00E+01	6.10E-02	3.40E+01
60-57-1	Dieldrin	2.00E-01	1.92E-02	4.74E-06	6.2E-04	--------[b]	2.50E+04	3.20E-04	5.9E-06
84-66-2	Diethyl Phthalate	1.10E+03	2.49E-02	6.35E-06	1.80E-05	--------[b]	3.20E+02	6.19E-03	1.60E-03
105-67-9	2,4-Dimethylphenol	7.90E+03	6.43E-02	8.69E-06	8.20E-05	--------[b]	2.00E+02	4.95E-02	9.80E-02
75-71-8	1,3-Dinitrobenzene	8.60E+02	4.55E-02	8.46E-06	2.30E-07	--------[b]	3.20E+01	1.92E-03	9.00E-04
51-28-5	2,4-Dinitrophenol	2.79E+03	2.73E-02	9.06E-06	1.82E-05	--------[b]	3.24E+01	1.32E-03	5.10E-03
121-14-2	2,4-Dinitrotoluene	2.70E+02	2.03E-01	7.06E-06	3.80E-06	--------[b]	8.90E+01	1.92E-03	1.47E-04
606-20-2	2,6-Dinitrotoluene	1.82E+02	3.70E-02	7.76E-06	3.06E-05	--------[b]	4.90E+01	1.92E-03	5.67E-04
88-85-7	Dinoseb	5.20E+01	2.45E-02	6.25E-06	1.87E-05	--------[b]	9.17E+01[d]	2.82E-03	7.50E-05
117-84-0	Di-n-octyl Phthalate	2.00E-02	1.73E-02	4.17E-06	2.74E-03	--------[b]	1.30E+05	1.90E-03	2.60E-06
123-91-1	p-Dioxane	1.00E+06	2.29E-01	1.02E-05	1.97E-04	1.07E-04	7.20E-01	1.92E-03	3.81E+01
115-29-7	Endosulfan	5.10E-01	1.85E-02	4.55E-06	4.51E-04	--------[b]	5.00E+03	7.63E-02	1.00E-05

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145-73-3	Endothall	2.10E+04	2.91E-02	8.07E-06	1.58E-14	-------[b]	7.59E+01	No Data	1.57E-10
72-20-8	Endrin	2.50E-01	1.92E-02	4.74E-6	3.08E-04	-------[b]	3.20E+04	3.20E-04	3.00E-06
100-41-4	Ethylbenzene	1.70E+02	7.50E-02	7.80E-06	3.24E-01	1.64E-01	3.20E+02	3.00E-03	9.60E+00
206-44-0	Fluoranthene	2.06E-01	2.51E-02	6.35E-06	6.60E-04	-------[b]	7.40E+04	1.90E-04	1.23E-08
86-73-7	Fluorene	2.00E+00	4.40E-02	7.88E-06	2.62E-03	-------[b]	1.30E+04	6.91E-04	6.30E-04
76-44-8	Heptachlor	1.80E-01	2.23E-02	5.69E-06	6.07E-02	1.73E-02	3.00E+03	1.30E-01	4.00E-04
1024-57-3	Heptachlor epoxide	2.00E-01	2.19E-02	5.57E-06	3.90E-04	-------[b]	2.00E+05	6.30E-04	1.90E-05
118-74-1	Hexachlorobenzene	6.20E-03	5.42E-02	5.91E-06	5.33E-02	1.35E-02	2.00E+04	1.70E-04	1.80E-05
319-84-6	Alpha-HCH (alpha-BHC)	2.00E+00	2.04E-02	5.04E-06	4.51E-04	-------[b]	5.00E+03	2.50E-03	4.50E-05
58-89-9	Gamma-HCH (Lindane)	7.30E+00	2.75E-02	7.34E-06	5.74E-04	-------[b]	3.00E+03	2.90E-03	4.10E-04
2691-41-0	HMX	5.00E+00	2.69E-02	7.15E-06	8.67E-10	3.55E-08	1.40E+00	No Data	3.30E-14
77-47-4	Hexachlorocyclo-Pentadiene	1.80E+00	2.79E-02	7.21E-06	1.11E+00	4.22E-01	1.20E+04	1.20E-02	5.96E-02
67-72-1	Hexachloroethane	5.00E+01	2.50E-03	6.80E-06	1.59E-01	7.26E-02	1.50E+03	1.92E-03	2.10E-01

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193-39-5	Indeno(1,2,3-c,d)pyrene	2.20E-05	2.25E-02	5.66E-06	6.56E-05	--------[b]	3.10E+06	4.70E-04	1.00E-10
78-59-1	Isophorone	1.20E+04	6.23E-02	6.76E-06	2.72E-04	1.12E-04	2.50E+01	1.24E-02	4.38E-01
98-82-8	Isopropylbenzene (Cumene)	6.10E+01	6.50E-02	7.10E-06	4.92E+01	2.10E+01	1.02E+03	4.33E-02	4.50E+00
93-65-2	MCPP (Mecoprop)	8.95E+02	2.40E-02	6.05E-06	7.70E-09	--------[b]	1.84E+01[d]	3.85E-03	2.44E-05
7439-97-6	Mercury	6.00E-02	7.14E-02	3.01E-05	4.51E-01	1.59E-01	8.70E+03	No Data	2.00E-03
72-43-5	Methoxychlor	4.50E-02	1.84E-02	4.46E-06	6.56E-04	--------[b]	5.00E+04	1.90E-03	6.00E-07
74-83-9	Methyl Bromide	1.50E+04	7.28E-02	1.21E-05	2.56E-01	1.79E-01	1.00E+01	1.82E-02	1.62E+03
1634-04-4	Methyl tertiary-butyl ether	5.10E+04	8.59E-01	1.10E-05	2.42E-02	1.50E-02	1.00E+01	1.93E-03	2.50E+02
75-09-2	Methylene Chloride	1.30E+04	1.01E-01	1.17E-05	9.02E-02	5.70E-02	1.30E+01	1.20E-02	4.30E+02
93-65-2	2-Methylnaphthalene	2.50E+01	5.22E-02	7.75E-06	2.10E-02	6.95E-03	1.60E+03	No Data	6.80E-02
95-48-7	2-Methylphenol (o-cresol)	2.60E+04	7.40E-02	8.30E-06	4.92E-05	2.00E-05	4.20E+01	4.95E-02	2.99E-01
91-20-3	Naphthalene	3.10E+01	5.90E-02	7.50E-06	1.97E-02	8.29E-03	5.00E+02	2.70E-03	8.50E-02
98-95-3	Nitrobenzene	2.09E+03	7.60E-02	8.60E-06	9.84E-04	3.99E-04	4.00E+01	1.76E-03	2.40E-01

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86-30-6	N-Nitrosodiphenylamine	3.50E+01	2.83E-02	7.19E-06	2.10E-04	--------[b]	1.00E+03	1.00E-02	6.70E-04
621-64-7	N-Nitrosodi-n-propylamine	9.89E+03	5.87E-02	8.17E-06	9.20E-05	5.48E-05	1.45E+01	1.90E-03	1.30E-01
87-86-5	Pentachlorophenol	2.00E+03	5.60E-02	6.10E-06	9.84E-07	--------[b]	2.77E+03[d]	4.50E-04	3.20E-05
108-95-2	Phenol	8.30E+04	8.20E-02	9.10E-06	1.64E-05	6.67E-06	2.00E+01	9.90E-02	2.80E-01
1918-02-1	Picloram	4.30E+02	2.26E-02	5.64E-06	2.19E-12	--------[b]	2.00E+00	No Data	7.21E-11
1336-36-3	Polychlorinated biphenyls (PCBs)	--------[a]	--------[a]	--------[a]	--------[a]	--------[b]	--------[a]	--------[a]	--------[a]
129-00-0	Pyrene	1.40E+00	2.77E-02	7.24E-06	4.51E-04	--------[b]	6.31E+04	1.80E-04	4.60E-06
121-82-4	RDX	5.97E+01	3.11E-02	8.49E-06	2.01E-11	--------[b]	7.20E+00	No Data	4.10E-09
122-34-9	Simazine	6.20E+00	2.48E-02	6.28E-06	3.80E-08	--------[b]	1.32E+02	No Data	2.21E-08
100-42-5	Styrene	3.10E+02	7.10E-02	8.00E-06	1.11E-01	5.48E-03	3.16E+02	3.30E-03	6.10E+00
93-72-1	2,4,5-TP (Silvex)	7.10E+01	2.30E-02	5.83E-06	3.71E-07	--------[b]	5.50E+03	No Data	9.97E-06
127-18-4	Tetrachloroethylene	2.00E+02	7.20E-02	8.20E-06	7.38E-01	4.00E-01	6.31E+02	9.60E-04	1.90E+01
108-88-3	Toluene	5.30E+02	8.70E-02	8.60E-06	2.71E-01	1.49E-01	1.58E+02	1.10E-02	2.80E+01

CAS No.	Chemical	Solubility in Water (S) (mg/L)	Diffusivity in Air (Di) (cm^2/s)	Diffusivity in Water (D_w) (cm^2/s)	Dimensionless Henry's Law Constant (H') (25°C)	Dimensionless Henry's Law Constant (H') (13°C) For the indoor inhalation exposure route	Organic Carbon Partition Coefficient (K_{oc}) (L/kg)	First Order Degradation Constant (λ) (d^{-1})	Vapor Pressure (mm/Hg)
8001-35-2	Toxaphene	7.40E-01	2.16E-02	5.51E-06	2.46E-04	--------[b]	5.01E+04	No Data	9.80E-07
120-82-1	1,2,4-Trichlorobenzene	3.50E+01	3.00E-02	8.23E-06	5.74E-02	2.38E-02	1.58E+03	1.90E-03	4.30E-01
71-55-6	1,1,1-Trichloroethane	1.30E+03	7.80E-02	8.80E-06	6.97E-01	4.21E-01	1.26E+02	1.30E-03	1.20E+02
79-00-5	1,1,2-Trichloroethane	4.40E+03	7.80E-02	8.80E-06	3.73E-02	1.98E-02	5.01E+01	9.50E-04	2.30E+01
79-01-6	Trichloroethylene	1.50E+03	7.90E-02	9.10E-06	4.10E-01	2.41E-01	1.00E+02	4.20E-04	7.30E+01
75-69-4	Trichlorofluoromethane	1.10E+03	8.70E-02	9.70E-06	9.70E-02	3.98E+00	1.30E+02	9.63E-04	8.00E+02
95-95-4	2,4,5-Trichlorophenol	8.00E+02	2.91E-02	7.03E-06	3.53E-04	--------[b]	2.68E+03[d]	3.80E-04	2.40E-02
88-06-2	2,4,6-Trichlorophenol	1.20E+03	2.61E-02	6.36E-06	1.78E-04	--------[b]	8.78E+02[d]	3.80E-04	2.00E-02
108-05-4	Vinyl Acetate	2.00E+04	8.50E-02	9.20E-06	2.09E-02	1.18E-02	4.57E+00	No Data	9.00E+01
99-35-4	1,3,5-Trinitrobenzene	2.80E+02	2.41E-02	6.08E-06	3.30E-10	--------[b]	1.60E+01	No Data	6.40E-06
118-96-7	2,4,6-Trinitrotoluene	1.24E+02	2.94E-02	7.90E-06	4.87E-09	--------[b]	3.72E+01	1.92E-03	2.02E-06
57-01-4	Vinyl Chloride	8.80E+03	1.06E-01	1.23E-06	1.11E+00	8.14E-01	1.58E+01	2.40E-04	3.00E+03
108-38-3	m-Xylene	1.60E+02	7.00E-02	7.80E-06	2.99E-01	1.52E-01	3.98E+02	1.90E-03	8.50E+00

CAS No.	Chemical	Solubility in Water (S) (mg/L)	Diffusivity in Air (Di) (cm^2/s)	Diffusivity in Water (D_w) (cm^2/s)	Dimensionless Henry's Law Constant (H') (25°C)	Dimensionless Henry's Law Constant (H') (13°C) For the indoor inhalation exposure route	Organic Carbon Partition Coefficient (K_{oc}) (L/kg)	First Order Degradation Constant (λ) (d^{-1})	Vapor Pressure (mm/Hg)
95-47-6	o-Xylene	1.80E+02	8.70E-02	1.00E-05	2.13E-01	1.07E-01	3.16E+02	1.90E-03	6.60E+00
106-42-3	p-Xylene	1.60E+02	7.69E-02	8.44E-06	3.16E-01	1.59E-01	3.16E+02	1.90E-03	8.90E+00
1330-20-7	Xylenes (total)	1.10E+02	7.35E-02	9.23E-06	2.71E-01	NA	3.98E+02	1.90E-03	8.00E+00

Chemical Abstracts Service (CAS) registry number. This number in the format xxx-xx-x, is unique for each chemical and allows efficient searching on computerized data bases.

[a] Soil Remediation objectives are determined pursuant to 40 CFR 761, as incorporated by reference at Section 732.104 (the USEPA "PCB Spill Cleanup Policy"), for most sites; persons remediating sites should consult with BOL if calculation of Tier 2 soil remediation objectives is desired.

[b] Dimensionless Henry's Law Constant at 13°C is not calculated because the chemical is not volatile and does not require evaluation under the indoor inhalation exposure route.

[c] Dimensionless Henry's Law Constant = 20°C

[d] These chemicals are ionizing and its K_{oc} value will change with pH. The K_{oc} values listed in this table is the effective K_{oc} at pH of 6.8. If the site-specific pH is values other than 6.8, the K_{oc} value listed in Section 742, Appendix C, Table I should be used.

(Source: Added at ___ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX C: Tier 2 Illustrations and Tables

Section 742.Table F: Methods for Determining Physical Soil Parameters

Methods for Determining Physical Soil Parameters		
Parameter	Sampling Location[a]	Method
ρ_b (soil bulk density)	Surface	ASTM - D 1556-90 Sand Cone Method[b]
		ASTM - D 2167-94 Rubber Balloon Method[b]
		ASTM - D 2922-91 Nuclear Method[b]
	Subsurface	ASTM - D 2937-94 Drive Cylinder Method[b]
ρ_s (soil particle density)	Surface or Subsurface	ASTM - D 854-92 Specific Gravity of Soil[b]
w (moisture content)	Surface or Subsurface	ASTM - D 4959-89 (Reapproved 1994) Standard[b]
		ASTM - D 4643-93 Microwave Oven[b]
		ASTM - D2216-92 Laboratory Determination[b]
		ASTM - D3017-88 (Reapproved 1993) Nuclear Method[b]
		Equivalent USEPA Method (e.g., sample preparation procedures described in methods 3541 or 3550)
f_{oc} (fraction organic carbon content)	Surface or Subsurface	ASTM - D 2974-00 Moisture, Ash, and Organic Matter[b] appropriately adjusted to estimate the fraction of organic carbon as stated in Nelson and Sommers (1982)

Methods for Determining Physical Soil Parameters		
Parameter	Sampling Location[a]	Method
η or θ_T (total soil porosity)	Surface or Subsurface (calculated)	Equation S24 in Appendix C, Table A for SSL Model, or Equation R23 in Appendix C, Table C for RBCA Model, or Equation J&E 16 in Appendix C, Table L for J&E Model
θ_a or θ_{as} (air-filled soil porosity)	Surface or Subsurface (calculated)	Equation S21 in Appendix C, Table A for SSL Model, or Equation R21 in Appendix C, Table C for RBCA Model, or Equation J&E 18 in Appendix C, Table L for J&E Model
θ_w or θ_{ws} (water-filled soil porosity)	Surface or Subsurface (calculated)	Equation S20 in Appendix C, Table A for SSL Model, or Equation R22 in Appendix C, Table C for RBCA Model, or Equation J&E 17 in Appendix C, Table L for J&E Model
K (hydraulic conductivity)	Surface or Subsurface	ASTM - D 5084-90 Flexible Wall Permeameter
		Pump Test
		Slug Test
i (hydraulic gradient)	Surface or Subsurface	Field Measurement

[a] This is the location where the sample is collected
[b] As incorporated by reference in Section 742.120.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

Section 742.APPENDIX C Tier 2 Illustrations and Tables

Section 742.TABLE I: Koc Values for Ionizing Organics as a Function of pH (cm^3/g or L/kg or cm^3 water/g soil)

pH	Benzoic Acid	2-Chloro-phenol	2,4-Dichloro-phenol	Pentachloro-phenol	2,4,5 Trichloro-phenol	2,4,6 Trichloro-phenol	Dinoseb	2,4,5 TP (Silvex)
4.5	1.07E+01	3.98E+02	1.59E+02	1.34E+04	2.37E+03	1.06E+03	3.00E+04	1.28E+04
4.6	9.16E+00	3.98E+02	1.59E+02	1.24E+04	2.37E+03	1.05E+03	2.71E+04	1.13E+04
4.7	7.79E+00	3.98E+02	1.59E+02	1.13E+04	2.37E+03	1.05E+03	2.41E+04	1.01E+04
4.8	6.58E+00	3.98E+02	1.59E+02	1.02E+04	2.37E+03	1.05E+03	2.12E+04	9.16E+03
4.9	5.54E+00	3.98E+02	1.59E+02	9.05E+03	2.37E+03	1.04E+03	1.85E+04	8.40E+03
5.0	4.62E+00	3.98E+02	1.59E+02	7.96E+03	2.36E+03	1.03E+03	1.59E+04	7.76E+03
5.1	3.86E+00	3.98E+02	1.59E+02	6.93E+03	2.36E+03	1.02E+03	1.36E+04	7.30E+03
5.2	3.23E+00	3.98E+02	1.59E+02	5.97E+03	2.35E+03	1.01E+03	1.15E+04	6.91E+03
5.3	2.70E+00	3.98E+02	1.59E+02	5.10E+03	2.34E+03	9.99E+02	9.66E+03	6.60E+03
5.4	2.27E+00	3.98E+02	1.58E+02	4.32E+03	2.33E+03	9.82E+02	8.10E+03	6.36E+03
5.5	1.92E+00	3.97E+02	1.58E+02	3.65E+03	2.32E+03	9.62E+02	6.77E+03	6.16E+03
5.6	1.63E+00	3.97E+02	1.58E+02	3.07E+03	2.31E+03	9.38E+02	5.65E+03	6.00E+03
5.7	1.40E+00	3.97E+02	1.58E+02	2.58E+03	2.29E+03	9.10E+02	4.73E+03	5.88E+03
5.8	1.22E+00	3.97E+02	1.58E+02	2.18E+03	2.27E+03	8.77E+02	3.97E+03	5.78E+03
5.9	1.07E+00	3.97E+02	1.57E+02	1.84E+03	2.24E+03	8.39E+02	3.35E+03	5.70E+03
6.0	9.50E-01	3.96E+02	1.57E+02	1.56E+03	2.21E+03	7.96E+02	2.84E+03	5.64E+03
6.1	8.54E-01	3.96E+02	1.57E+02	1.33E+03	2.17E+03	7.48E+02	2.43E+03	5.59E+03
6.2	7.78E-01	3.96E+02	1.56E+02	1.15E+03	2.12E+03	6.97E+02	2.10E+03	5.55E+03

6.3	7.19E-01	3.95E+02	1.55E+02	9.98E+02	2.06E+03	6.44E+02	1.83E+03	5.52E+03
6.4	6.69E-01	3.94E+02	1.54E+02	8.77E+02	1.99E+03	5.89E+02	1.62E+03	5.50E+03
6.5	6.31E-01	3.93E+02	1.53E+02	7.81E+02	1.91E+03	5.33E+02	1.45E+03	5.48E+03
6.6	6.00E-01	3.92E+02	1.52E+02	7.03E+02	1.82E+03	4.80E+02	1.32E+03	5.46E+03
6.7	5.74E-01	3.90E+02	1.50E+02	6.40E+02	1.71E+03	4.29E+02	1.21E+03	5.45E+03
6.8	5.55E-01	3.88E+02	1.47E+02	5.92E+02	1.60E+03	3.81E+02	1.12E+03	5.44E+03
6.9	5.39E-01	3.86E+02	1.45E+02	5.52E+02	1.47E+03	3.38E+02	1.05E+03	5.43E+03
7.0	5.28E-01	3.83E+02	1.41E+02	5.21E+02	1.34E+03	3.00E+02	9.96E+02	5.43E+03
7.1	5.18E-01	3.79E+02	1.38E+02	4.96E+02	1.21E+03	2.67E+02	9.52E+02	5.42E+03
7.2	5.10E-01	3.75E+02	1.33E+02	4.76E+02	1.07E+03	2.39E+02	9.18E+02	5.42E+03
7.3	5.04E-01	3.69E+02	1.28E+02	4.61E+02	9.43E+02	2.15E+02	8.90E+02	5.42E+03
7.4	4.99E-01	3.62E+02	1.21E+02	4.47E+02	8.19E+02	1.95E+02	8.68E+02	5.41E+03
7.5	4.95E-01	3.54E+02	1.14E+02	4.37E+02	7.03E+02	1.78E+02	8.50E+02	5.41E+03
7.6	4.92E-01	3.44E+02	1.07E+02	4.29E+02	5.99E+02	1.64E+02	8.36E+02	5.41E+03
7.7	4.86E-01	3.33E+02	9.84E+01	4.23E+02	5.07E+02	1.53E+02	8.25E+02	5.41E+03
7.8	4.86E-01	3.19E+02	8.97E+01	4.18E+02	4.26E+02	1.44E+02	8.17E+02	5.41E+03
7.9	4.85E-01	3.04E+02	8.07E+01	4.14E+02	3.57E+02	1.37E+02	8.10E+02	5.41E+03
8.0	4.85E-01	2.86E+02	7.17E+01	4.10E+02	2.98E+02	1.31E+02	8.04E+02	5.41E+03
8.1	4.84E-01	2.67E+02	6.30E+01	4.09E+02	2.49E+02	1.26E+02	8.00E+02	5.40E+03
8.2	4.84E-01	2.46E+02	5.47E+01	4.07E+02	2.08E+02	1.22E+02	7.97E+02	5.40E+03
8.3	4.83E-01	2.24E+02	4.40E+01	4.05E+02	1.75E+02	1.19E+02	7.93E+02	5.40E+03
8.4	4.83E-01	2.02E+02	4.00E+01	4.04E+02	1.48E+02	1.17E+02	7.91E+02	5.40E+03

~~8.5~~	~~4.82E-01~~	~~1.80E+02~~	~~3.38E+01~~	~~4.03E+02~~	~~1.25E+02~~	~~1.15E+02~~	~~7.89E+02~~	~~5.40E+03~~
~~8.6~~	~~4.82E-01~~	~~1.58E+02~~	~~2.84E+01~~	~~4.02E+02~~	~~1.08E+02~~	~~1.13E+02~~	~~7.88E+02~~	~~5.40E+03~~
~~8.7~~	~~4.82E-01~~	~~1.37E+02~~	~~2.38E+01~~	~~4.02E+02~~	~~9.31E+02~~	~~1.12E+02~~	~~7.87E+02~~	~~5.40E+03~~
~~8.8~~	~~4.81E-01~~	~~1.18E+02~~	~~1.99E+01~~	~~4.01E+02~~	~~8.16E+02~~	~~1.11E+02~~	~~7.86E+02~~	~~5.40E+03~~
~~8.9~~	~~4.81E-01~~	~~1.00E+02~~	~~1.66E+01~~	~~4.01E+02~~	~~7.23E+01~~	~~1.10E+02~~	~~7.85E+02~~	~~5.40E+03~~
~~9.0~~	~~4.80E-01~~	~~8.47E+01~~	~~1.39E+01~~	~~4.00E+02~~	~~6.48E+01~~	~~1.09E+02~~	~~7.85E+02~~	~~5.40E+03~~

pH	Benzoic Acid	2-Chlorophenol	2,4-Dichlorophenol	Dinoseb	MCPP	Pentachlorophenol	2,4,5-Trichlorophenol	2,4,6,-Trichlorophenol
4.5	2.40E+01	6.03E+01	7.90E+02	2.46E+03	6.39E+01	6.21E+04	4.55E+03	3.87E+03
4.6	2.06E+01	6.03E+01	7.90E+02	2.22E+03	5.48E+01	5.66E+04	4.55E+03	3.84E+03
4.7	1.76E+01	6.03E+01	7.89E+02	1.97E+03	4.75E+01	5.10E+04	4.54E+03	3.81E+03
4.8	1.48E+01	6.03E+01	7.89E+02	1.74E+03	4.16E+01	4.54E+04	4.54E+03	3.76E+03
4.9	1.25E+01	6.03E+01	7.89E+02	1.51E+03	3.68E+01	3.99E+04	4.53E+03	3.71E+03
5.0	1.05E+01	6.03E+01	7.89E+02	1.30E+03	3.31E+01	3.47E+04	4.52E+03	3.65E+03
5.1	8.74E+00	6.03E+01	7.89E+02	1.11E+03	3.00E+01	2.99E+04	4.51E+03	3.57E+03
5.2	7.30E+00	6.03E+01	7.88E+02	9.40E+02	2.76E+01	2.55E+04	4.49E+03	3.48E+03
5.3	6.11E+00	6.03E+01	7.88E+02	7.91E+02	2.57E+01	2.17E+04	4.47E+03	3.37E+03
5.4	5.13E+00	6.03E+01	7.87E+02	6.63E+02	2.42E+01	1.83E+04	4.44E+03	3.25E+03
5.5	4.33E+00	6.02E+01	7.87E+02	5.54E+02	2.29E+01	1.54E+04	4.41E+03	3.10E+03
5.6	3.68E+00	6.02E+01	7.86E+02	4.63E+02	2.20E+01	1.30E+04	4.37E+03	2.94E+03
5.7	3.15E+00	6.02E+01	7.85E+02	3.87E+02	2.12E+01	1.09E+04	4.33E+03	2.77E+03
5.8	2.73E+00	6.02E+01	7.84E+02	3.25E+02	2.06E+01	9.21E+03	4.27E+03	2.57E+03
5.9	2.39E+00	6.02E+01	7.82E+02	2.74E+02	2.01E+01	7.82E+03	4.19E+03	2.37E+03
6.0	2.11E+00	6.01E+01	7.80E+02	2.32E+02	1.97E+01	6.68E+03	4.11E+03	2.17E+03
6.1	1.90E+00	6.01E+01	7.78E+02	1.99E+02	1.95E+01	5.75E+03	4.00E+03	1.96E+03
6.2	1.72E+00	6.00E+01	7.74E+02	1.72E+02	1.91E+01	5.00E+03	3.88E+03	1.76E+03
6.3	1.58E+00	6.00E+01	7.70E+02	1.50E+02	1.90E+01	4.40E+03	3.73E+03	1.58E+03
6.4	1.47E+00	5.99E+01	7.66E+02	1.33E+02	1.88E+01	3.92E+03	3.56E+03	1.40E+03
6.5	1.38E+00	5.98E+01	7.60E+02	1.19E+02	1.87E+01	3.53E+03	3.37E+03	1.24E+03
6.6	1.31E+00	5.97E+01	7.52E+02	1.08E+02	1.86E+01	3.22E+03	3.16E+03	1.10E+03
6.7	1.26E+00	5.95E+01	7.43E+02	9.87E+01	1.85E+01	2.97E+03	2.93E+03	9.82E+02
6.8	1.21E+00	5.93E+01	7.32E+02	9.17E+01	1.84E+01	2.77E+03	2.68E+03	8.78E+02

pH	Benzoic Acid	2-Chlorophenol	2,4-Dichlorophenol	Dinoseb	MCPP	Pentachlorophenol	2,4,5-Trichlorophenol	2,4,6,-Trichlorophenol
6.9	1.18E+00	5.90E+01	7.18E+02	8.60E+01	1.84E+01	2.61E+03	2.42E+03	7.90E+02
7.0	1.15E+00	5.87E+01	7.01E+02	8.15E+01	1.84E+01	2.49E+03	2.16E+03	7.17E+02
7.1	1.12E+00	5.83E+01	6.81E+02	7.79E+01	1.83E+01	2.39E+03	1.91E+03	6.56E+02
7.2	1.11E+00	5.78E+01	6.58E+02	7.51E+01	1.83E+01	2.31E+03	1.66E+03	6.06E+02
7.3	1.09E+00	5.72E+01	6.31E+02	7.28E+01	1.83E+01	2.25E+03	1.44E+03	5.65E+02
7.4	1.08E+00	5.65E+01	6.00E+02	7.10E+01	1.83E+01	2.20E+03	1.23E+03	5.32E+02
7.5	1.07E+00	5.55E+01	5.65E+02	6.96E+01	1.82E+01	2.16E+03	1.04E+03	5.05E+02
7.6	1.07E+00	5.44E+01	5.26E+02	6.84E+01	1.82E+01	2.12E+03	8.77E+02	4.84E+02
7.7	1.06E+00	5.31E+01	4.85E+02	6.75E+01	1.82E+01	2.10E+03	7.35E+02	4.67E+02
7.8	1.06E+00	5.15E+01	4.41E+02	6.68E+01	1.82E+01	2.08E+03	6.15E+02	4.53E+02
7.9	1.05E+00	4.96E+01	3.96E+02	6.63E+01	1.82E+01	2.06E+03	5.13E+02	4.42E+02
8.0	1.05E+00	4.75E+01	3.52E+02	6.58E+01	1.82E+01	2.05E+03	4.29E+02	4.33E+02
8.1	1.05E+00	4.50E+01	3.09E+02	6.54E+01	1.82E+01	2.04E+03	3.60E+02	4.26E+02
8.2	1.04E+00	4.23E+01	2.68E+02	6.52E+01	1.82E+01	2.03E+03	3.03E+02	4.20E+02
8.3	1.04E+00	3.92E+01	2.30E+02	6.49E+01	1.82E+01	2.02E+03	2.57E+02	4.15E+02
8.4	1.04E+00	3.60E+01	1.96E+02	6.47E+01	1.82E+01	2.02E+03	2.19E+02	4.12E+02
8.5	1.04E+00	3.27E+01	1.65E+02	6.46E+01	1.82E+01	2.02E+03	1.89E+02	4.09E+02
8.6	1.04E+00	2.92E+01	1.39E+02	6.45E+01	1.82E+01	2.01E+03	1.65E+02	4.07E+02
8.7	1.04E+00	2.59E+01	1.16E+02	6.44E+01	1.82E+01	2.01E+03	1.45E+02	4.05E+02
8.8	1.04E+00	2.26E+01	9.71E+01	6.43E+01	1.82E+01	2.01E+03	1.30E+02	4.04E+02
8.9	1.04E+00	1.95E+01	8.11E+01	6.43E+01	1.82E+01	2.01E+03	1.17E+02	4.02E+02
9.0	1.04E+00	1.67E+01	6.79E+01	6.42E+01	1.82E+01	2.00E+03	1.07E+02	4.01E+02

(Source: Amended at ___ Ill. Reg. _____, effective _____)

POLLUTION CONTROL BOARD

NOTICE OF PROPOSED AMENDMENTS

Section 742.APPENDIX C Tier 2 Illustrations and Tables

Section 742.TABLE J Values to be Substituted for k_d or k_s when Evaluating Inorganics as a Function of pH (cm^3/g or L/kg or cm^3_{water}/g_{soil})

pH	As	Ba	Be	Cd	Cr (+3)	Cr (+6)	Hg	Ni	Ag	Se	Tl	Zn	Pb
4.9	2.5E+01	1.1E+01	2.3E+01	1.5E+01	1.2E+03	3.1E+01	4.0E-02	1.6E+01	1.0E-01	1.8E+01	4.4E+01	1.6E+01	1.5E+01
5.0	2.5E+01	1.2E+01	2.6E+01	1.7E+01	1.9E+03	3.1E+01	6.0E-02	1.8E+01	1.3E-01	1.7E+01	4.5E+01	1.8E+01	1.5E+01
5.1	2.5E+01	1.4E+01	2.8E+01	1.9E+01	3.0E+03	3.0E+01	9.0E-02	2.0E+01	1.6E-01	1.6E+01	4.6E+01	1.9E+01	1.5E+01
5.2	2.6E+01	1.5E+01	3.1E+01	2.1E+01	4.9E+03	2.9E+01	1.4E-01	2.2E+01	2.1E-01	1.5E+01	4.7E+01	2.1E+01	1.5E+01
5.3	2.6E+01	1.7E+01	3.5E+01	2.3E+01	8.1E+03	2.8E+01	2.0E-01	2.4E+01	2.6E-01	1.4E+01	4.8E+01	2.3E+01	1.5E+01
5.4	2.6E+01	1.9E+01	3.8E+01	2.5E+01	1.3E+04	2.7E+01	3.0E-01	2.6E+01	3.3E-01	1.3E+01	5.0E+01	2.5E+01	1.5E+01
5.5	2.6E+01	2.1E+01	4.2E+01	2.7E+01	2.1E+04	2.7E+01	4.6E-01	2.8E+01	4.2E-01	1.2E+01	5.1E+01	2.6E+01	1.5E+01
5.6	2.6E+01	2.2E+01	4.7E+01	2.9E+01	3.5E+04	2.6E+01	6.9E-01	3.0E+01	5.3E-01	1.1E+01	5.2E+01	2.8E+01	1.5E+01
5.7	2.7E+01	2.4E+01	5.3E+01	3.1E+01	5.5E+04	2.5E+01	1.0E-00	3.2E+01	6.7E-01	1.1E+01	5.4E+01	3.0E+01	1.5E+01
5.8	2.7E+01	2.6E+01	6.0E+01	3.3E+01	8.7E+04	2.5E+01	1.6E-00	3.4E+01	8.4E-01	9.8E+00	5.5E+01	3.2E+01	1.5E+01
5.9	2.7E+01	2.8E+01	6.9E+01	3.5E+01	1.3E+05	2.4E+01	2.3E-00	3.6E+01	1.1E+00	9.2E+00	5.6E+01	3.4E+01	1.5E+01
6.0	2.7E+01	3.0E+01	8.2E+01	3.7E+01	2.0E+05	2.3E+01	3.5E-00	3.8E+01	1.3E+00	8.6E+00	5.8E+01	3.6E+01	1.5E+01
6.1	2.7E+01	3.1E+01	9.9E+01	4.0E+01	3.0E+05	2.3E+01	5.1E-00	4.0E+01	1.7E+00	8.0E+00	5.9E+01	3.9E+01	1.5E+01
6.2	2.8E+01	3.3E+01	1.2E+02	4.2E+01	4.2E+05	2.2E+01	7.5E-00	4.2E+01	2.1E+00	7.5E+00	6.1E+01	4.2E+01	1.5E+01
6.3	2.8E+01	3.5E+01	1.6E+02	4.4E+01	5.8E+05	2.2E+01	1.1E+01	4.5E+01	2.7E+00	7.0E+00	6.2E+01	4.4E+01	1.5E+01
6.4	2.8E+01	3.6E+01	2.1E+02	4.8E+01	7.7E+05	2.1E+01	1.6E+01	4.7E+01	3.4E+00	6.5E+00	6.4E+01	4.7E+01	7.1E+02
6.5	2.8E+01	3.7E+01	2.8E+02	5.2E+01	9.9E+05	2.0E+01	2.2E+01	5.0E+01	4.2E+00	6.1E+00	6.6E+01	5.1E+01	7.1E+02
6.6	2.8E+01	3.9E+01	3.9E+02	5.7E+01	1.2E+06	2.0E+01	3.0E+01	5.4E+01	5.3E+00	5.7E+00	6.7E+01	5.4E+01	7.1E+02

pH	As	Ba	Be	Cd	Cr (+3)	Cr (+6)	Hg	Ni	Ag	Se	Tl	Zn	Pb
6.7	2.9E+01	4.0E+01	5.5E+02	6.4E+01	1.5E+06	1.9E+01	4.0E+01	5.8E+01	6.6E+00	5.3E+00	6.9E+01	5.8E+01	7.1E+02
6.8	2.9E+01	4.1E+01	7.9E+02	7.5E+01	1.8E+06	1.9E+01	5.2E+01	6.5E+01	8.3E+00	5.0E+00	7.1E+01	6.2E+01	7.1E+02
6.9	2.9E+01	4.2E+01	1.1E+03	9.1E+01	2.1E+06	1.8E+01	6.6E+01	7.4E+01	1.0E+01	4.7E+00	7.3E+01	6.8E+01	7.1E+02
7.0	2.9E+01	4.2E+01	1.7E+03	1.1E+02	2.5E+06	1.8E+01	8.2E+01	8.8E+01	1.3E+01	4.3E+00	7.4E+01	7.5E+01	7.1E+02
7.1	2.9E+01	4.3E+01	2.5E+03	1.5E+02	2.8E+06	1.7E+01	9.9E+01	1.1E+02	1.6E+01	4.1E+00	7.6E+01	8.3E+01	7.1E+02
7.2	3.0E+01	4.4E+01	3.8E+03	2.0E+02	3.1E+06	1.7E+01	1.2E+02	1.4E+02	2.0E+01	3.8E+00	7.8E+01	9.5E+01	7.1E+02
7.3	3.0E+01	4.4E+01	5.7E+03	2.8E+02	3.4E+06	1.6E+01	1.3E+02	1.8E+02	2.5E+01	3.5E+00	8.0E+01	1.1E+02	7.1E+02
7.4	3.0E+01	4.5E+01	8.6E+03	4.0E+02	3.7E+06	1.6E+01	1.5E+02	2.5E+02	3.1E+01	3.3E+00	8.2E+01	1.3E+02	7.1E+02
7.5	3.0E+01	4.6E+01	1.3E+04	5.9E+02	3.9E+06	1.6E+01	1.6E+02	3.5E+02	3.9E+01	3.1E+00	8.5E+01	1.6E+02	7.1E+02
7.6	3.1E+01	4.6E+01	2.0E+04	8.7E+02	4.1E+06	1.5E+01	1.7E+02	4.9E+02	4.8E+01	2.9E+00	8.7E+01	1.9E+02	7.1E+02
7.7	3.1E+01	4.7E+01	3.0E+04	1.3E+03	4.2E+06	1.5E+01	1.8E+02	7.0E+02	5.9E+01	2.7E+00	8.9E+01	2.4E+02	7.1E+02
7.8	3.1E+01	4.9E+01	4.6E+04	1.9E+03	4.3E+06	1.4E+01	1.9E+02	9.9E+02	7.3E+01	2.5E+00	9.1E+01	3.1E+02	7.1E+02
7.9	3.1E+01	5.0E+01	6.9E+04	2.9E+03	4.3E+06	1.4E+01	1.9E+02	1.4E+03	8.9E+01	2.4E+00	9.4E+01	4.0E+02	7.1E+02
8.0	3.1E+01	5.2E+01	1.0E+05	4.3E+03	4.3E+06	1.4E+01	2.0E+02	1.9E+03	1.1E+02	2.2E+00	9.6E+01	5.3E+02	7.1E+02
8.1	3.2E+01	---[a]	---[a]	---[a]	---[a]	1.3E+01	---[a]	---[a]	---[a]	2.1E+00	1.0E+02	---[a]	7.1E+02
8.2	3.2E+01	---[a]	---[a]	---[a]	---[a]	1.3E+01	---[a]	---[a]	---[a]	1.9E+00	1.0E+02	---[a]	7.1E+02
8.3	3.2E+01	---[a]	---[a]	---[a]	---[a]	1.3E+01	---[a]	---[a]	---[a]	1.8E+00	1.0E+02	---[a]	7.1E+02
8.4	3.2E+01	---[a]	---[a]	---[a]	---[a]	1.2E+01	---[a]	---[a]	---[a]	1.7E+00	1.1E+02	---[a]	7.1E+02
8.5	3.2E+01	---[a]	---[a]	---[a]	---[a]	1.2E+01	---[a]	---[a]	---[a]	1.6E+00	1.1E+02	---[a]	7.1E+02
8.6	3.3E+01	---[a]	---[a]	---[a]	---[a]	1.2E+01	---[a]	---[a]	---[a]	1.5E+00	1.1E+02	---[a]	7.1E+02
8.7	3.3E+01	---[a]	---[a]	---[a]	---[a]	1.2E+01	---[a]	---[a]	---[a]	1.4E+00	1.2E+02	---[a]	7.1E+02
8.8	3.3E+01	---[a]	---[a]	---[a]	---[a]	1.1E+01	---[a]	---[a]	---[a]	1.3E+00	1.2E+02	---[a]	1.9E+03

pH	As	Ba	Be	Cd	Cr (+3)	Cr (+6)	Hg	Ni	Ag	Se	Tl	Zn	Pb
8.9	3.3E+01	---[a]	---[a]	---[a]	---[a]	1.1E+01	---[a]	---[a]	---[a]	1.2E+00	1.2E+02	---[a]	1.9E+03
9.0	3.3E+01	---[a]	---[a]	---[a]	---[a]	1.0E+01	---[a]	---[a]	---[a]	1.1E+00	1.2E+02	---[a]	1.9E+03[b]

[a] No data available for this pH.
[b] For Lead, this value may be used up to a pH of 11.0.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 742.APPENDIX C: Tier 2 Tables

Section 742.Table L: J&E Equations

Indoor air remediation objectives (mg/m^3)	For carcinogenic contaminants	$RO_{indoor\text{-}air} = \frac{TR \times AT_c \times 365}{ED \times EF \times URF \times 1000}$	**J&E1**
	For noncarcinogenic contaminants	$RO_{indoor\text{-}air} = \frac{THQ \times AT_{nc} \times 365 \times RfC}{ED \times EF}$	**J&E2**
To convert mg/m^3 from parts per million volume		$mg/m^3 = \frac{ppm \times MW}{24.45}$	**J&E3**
Soil gas remediation objective (mg/m^3)		$RO_{soilgas} = \frac{RO_{indoor\text{-}air}}{\alpha}$	**J&E4**
Soil remediation objectives (mg/kg)		$RO_{soil} = \frac{RO_{soilgas} \times \left(\theta_w + K_d \times \rho_b + H'_{TS} \times \theta_a\right)}{H'_{TS} \times \rho_b \times 1000}$	**J&E5**
Saturated soil concentration (mg/kg)		$C_{sat} = \frac{S \times \left[\left(K_d \times \rho_b\right) + \theta_w + \left(H'_{TS} \times \theta_a\right)\right]}{\rho_b}$	**J&E6a**

Soil Vapor Saturation Limitx (mg/m^3-air)		$C_v^{sat} = \frac{P \times MW}{R \times T} \times 10^6$	**J&E6b**
Groundwater remediation objectives		$RO_{gw} = \frac{RO_{soil\,gas}}{H'_{TS} \times 1000}$	**J&E7**
Attenuation factor	Attenuation factor for cases where there is significant pressure difference between the building and the subsurface soil Q_{soil} = 83.33 cm^3/sec	$\alpha = \frac{\left[\left(\frac{D_T^{eff} \times A_B}{Q_{bldg} \times L_T}\right) \times \exp\left(\frac{Q_{soil} \times L_{crack}}{D_{crack}^{eff} \times A_{crack}}\right)\right]}{\left[\exp\left(\frac{Q_{soil} \times L_{crack}}{D_{crack}^{eff} \times A_{crack}}\right) + \left(\frac{D_T^{eff} \times A_B}{Q_{bldg} \times L_T}\right) + \left(\frac{D_T^{eff} \times A_B}{Q_{soil} \times L_T}\right)\left[\exp\left(\frac{Q_{soil} \times L_{crack}}{D_{crack}^{eff} \times A_{crack}}\right) - 1\right]\right]}$	**J&E8a**
	Attenuation factor for cases where there is no significant pressure difference between the building and the subsurface soil Q_{soil} = 0 cm^3/sec	$\alpha = \frac{\left(\frac{D_T^{eff} \times A_B}{Q_{bldg} \times L_T}\right)}{\left[1 + \left(\frac{D_T^{eff} \times A_B}{Q_{bldg} \times L_T}\right) + \left(\frac{D_T^{eff} \times A_B \times L_{crack}}{L_T \times D_{crack}^{eff} \times A_{crack}}\right)\right]}$	**J&E8b**

Total overall effective diffusion coefficient for vapor transport in porous media for multiple soil layers (cm^2/s)		$$D_T^{eff} = \frac{L_T}{\sum_{i=1}^{n} L_i / D_i^{eff}}$$	**J&E9a**
	In Equation J&E9a, the following condition **must** be satisfied:	$$\sum_{i=1}^{n} L_i = L_T$$	**J&E9b**
Source to building separation (cm)		$$L_T = D_{source} - L_F$$	**J&E10**
Effective diffusion coefficient for each soil layer (cm^2/s)		$$D_i^{eff} = D_i \left(\frac{\theta_{a,i}^{3.33}}{\theta_{T,i}^2} \right) + \left(\frac{D_w}{H'_{TS}} \right) \left(\frac{\theta_{w,i}^{3.33}}{\theta_{T,i}^2} \right)$$	**J&E11**
Surface area of enclosed space at or below grade (cm^2)	For a slab-on-grade building	$$A_B = (L_B \times W_B)$$	**J&E12a**
Surface are of enclosed space at or below grade (cm^2)	For a building with a basement	$$A_B = (L_B \times W_B) + (2 \times L_F \times L_B) + (2 \times L_F \times W_B)$$	**J&E12b**
Building ventilation rate (cm^3/s)		$$Q_{bldg} = \left(\frac{L_B \times W_B \times H_B \times ER}{3600} \right)$$	**J&E13**

Area of total cracks (cm^2)		$A_{crack} = 2 \times (L_B + W_B) \times w$	**J&E14**
Effective diffusion coefficient through the cracks (cm^2/s)		$D_{crack}^{eff} = D_i \left(\frac{\theta_{a,crack}^{3.33}}{\theta_{T,crack}^2} \right) + \left(\frac{D_w}{H'_{TS}} \right) \left(\frac{\theta_{w,crack}^{3.33}}{\theta_{T,crack}^2} \right)$	**J&E15**
Total porosity		$\theta_{Ti} = 1 - \frac{\rho_{bi}}{\rho_s}$	**J&E16**
Water-filled porosity		$\theta_w = (W) \left(\frac{\rho_b}{\rho_w} \right)$	**J&E17**
Air-filled porosity		$\theta_a = \theta_T - \theta_w$	**J&E18**

(Source: Added at ____ Ill. Reg. _____, effective _____)

Section 742.APPENDIX C: Tier 2 Tables

Section 742.Table M: J&E Parameters

Symbol	Parameter	Units	Source	Tier 1 or Calculated Value
A_B	Surface area of enclosed space at or below grade	cm^2	Equation J&E 12a or 12b, Appendix C, Table L	Residential = 1×10^6 Industrial/Commercial = 4.0×10^6
A_{crack}	Area of total cracks	cm^2	Equation J&E 14, Appendix C, Table L	Calculated Value
AT_c	Averaging time for carcinogens	year	SSL, Page 2-12	70
AT_{nc}	Averaging time for noncarcinogens	year	AT_{nc}= ED	Residential = 30 Industrial/Commercial = 25
C_{sat}	Soil saturation concentration	mg/kg	Equation J&E 6a, Appendix C, Table L	Chemical-Specific or Calculated Value
C_v^{sat}	Soil vapor concentration	mg/m^3-air	Equation J&E 6b, Appendix C, Table L	Chemical-Specific or Calculated Value
D_{crack}^{eff}	Effective diffusion coefficient through the cracks	cm^2/s	Equation J&E 15, Appendix C, Table L	Calculated Value
D_i	Diffusivity in air	cm^2/s	Appendix C, Table A	Chemical-Specific
D_i^{eff}	Effective diffusion coefficient of soil layer i	cm^2/s	Equation J&E 11, Appendix C, Table L	Calculated Value

Symbol	Parameter	Units	Source	Tier 1 or Calculated Value
D_{source}	Distance from ground surface to top of contamination	cm	Field Measurement	Soil Contamination = 152.4 Groundwater Contamination = 304.8 Site-Specific
D_T^{eff}	Total overall effective diffusion coefficient	cm^2/s	Equation J&E 9a, Appendix C, Table L	Calculated Value
D_w	Diffusivity in water	cm^2/s	Appendix C, Table E	Chemical-Specific
ED	Exposure duration	year	SSL Page 2-12	Residential = 30 Industrial/Commercial = 25
EF	Exposure frequency	day/year	SSL Page 2-12	Residential = 350 Industrial/Commercial = 250
ER	Air exchange rate	exchanges per hour	Illinois EPA	Residential = 0.53 Industrial/Commercial = 0.93
f_{oc}	Fraction organic carbon content	g/g	SSL or Field Measurement Appendix C, Table F	0.002 or Site-Specific

Symbol	Parameter	Units	Source	Tier 1 or Calculated Value
H_B	Height of building	cm	Illinois EPA	Slab on Grade Residential = 244 Industrial/Commercial = 305 or Site-Specific Basement Residential = 427 Industrial/Commercial = 488 or Site-Specific
H'_{TS}	Dimensionless Henry's law constant at the system (soil) temperature 13˚C	unitless	Appendix C, Table E	Chemical-Specific
K_d	Soil-water partition coefficient	cm^3/g	Equation S19, Appendix C, Table A	Calculated Value
K_{oc}	Organic carbon partition coefficient	cm^3/g	Appendix C, Table E or Appendix C, Table I	Chemical-Specific
L_B	Length of building	cm	Illinois EPA	Residential = 1000 Industrial/Commercial = 2000
L_{crack}	Slab thickness	cm	US EPA, 2004	10
L_F	Distance from ground surface to bottom of slab	cm	US EPA, 2004	10 (slab on grade) 200 (basement)

Symbol	Parameter	Units	Source	Tier 1 or Calculated Value
L_i	Thickness of soil layer i	cm	Field Measurement For capillary fringe, USEPA, 2004	Site-Specific For capillary fringe, 17 cm
L_T	Distance from bottom of slab to top of contamination	cm	Field Measurement or Equation J&E 10, Appendix C, Table L	142.4 or Site-Specific
MW	Molecular weight	g/mole	Illinois EPA	Chemical-Specific
n	Total number of layers of different types of soil vapors migrate through from source to building (if source is groundwater, include a capillary fringe layer of 17 cm as one of the layers)	unitless	Field measurement	Site-Specific
P	Vapor Pressure	atm	Illinois EPA	Chemical-Specific
Q_{bldg}	Building ventilation rate	cm^3/s	Equation J&E 13, Appendix C, Table L	Slab on Grade Residential = 3.59×10^4 Industrial/Commercial = 3.15×10^5 or Site-Specific Basement Residential = 6.28×10^4 Industrial/Commercial = 5.04×10^5 or Site-Specific

Symbol	Parameter	Units	Source	Tier 1 or Calculated Value
Q_{soil}	Volumetric flow rate of soil gas into the enclosed space	cm^3/s	US EPA, 2004 Part 742.505(a)(2)(D) and Part 742.505(b)(5)	Zero under Tiers 1 and 2 Under Tier 3, zero if L_T is greater than 5 feet (152 cm) 83.33 if L_T is less than 5 feet (152 cm)
R	Ideal gas constant	atm-L/mol-K	US EPA, 2004	0.08206
RfC	Reference concentration	ug/m^3	Illinois EPA	Toxicological-Specific
RO_{gw}	Groundwater remediation objective	mg/L	Appendix B, Table E, or Equation J&E 7, Appendix C, Table L	Chemical-Specific
$RO_{indoor-air}$	Indoor air remediation objective	mg/m^3	Equations J&E 1-2, Appendix C, Table L	Calculated Value
RO_{soil}	Soil remediation objective	mg/kg	Appendix B, Tables A or B or Equation J&E 5, Appendix C, Table L	Tier 1 or Calculated Value
$RO_{soilgas}$	Soil gas remediation objective	mg/m^3	Equation J&E 4, Appendix C, Table L	Calculated Value
S	Solubility in water	mg/L	Appendix C, Table E	Chemical-Specific

Symbol	Parameter	Units	Source	Tier 1 or Calculated Value
T	Temperature	K	US EPA, 2004	286 (converted from 13°C)
THQ	Target hazard quotient for a chemical	unitless	SSL	1
TR	Target risk or the increased chance of developing cancer over a lifetime due to exposure to a chemical	unitless	SSL	Residential = 10^{-6} at the point of human exposure Industrial/Commercial = 10^{-6} at the point of human exposure
URF	Unit risk factor	$(ug/m^3)^{-1}$	Illinois EPA	Toxicological- Specific
w	Floor-wall seam gap	cm	US EPA, 2004	0.1
W	Moisture content	g of water/g of soil	Field Measurement, Appendix C, Table F	Site-Specific
W_B	Width of building	cm	Illinois EPA	Residential = 1000 Industrial/Commercial = 2000 or Site-Specific
α	Attenuation factor (groundwater)	unitless	Equations J&E 8a or 8b, Appendix C, Table L	Site-Specific

Symbol	Parameter	Units	Source	Tier 1 or Calculated Value
Θ_a	Air-filled soil porosity	cm^3/cm^3	Equation J&E 18, Appendix C, Table L	0.28 or Calculated Value
$\Theta_{a,crack}$	Air-filled porosity for soil in cracks	cm^3/cm^3	Equation S21, Appendix C, Table A	0.28
$\Theta_{a,i}$	Air-filled porosity of soil layer i	cm^3/cm^3	Equation S21, Appendix C, Table A	0.28 or Calculated Value For capillary fringe, $\Theta_{a,i} = 0.1\ \Theta_{T,i}$
$\Theta_{T,crack}$	Total porosity for soil in cracks	cm^3/cm^3	Equation S24, Appendix C, Table A	0.43
$\Theta_{T,i}$	Total porosity of soil layer i	cm^3/cm^3	Equation J&E 16, Appendix C, Table L	0.43 or Calculated Value
Θ_w	Water-filled soil porosity	cm^3/cm^3	Equation J&E 17, Appendix C, Table L	0.15 or Calculated Value
$\Theta_{w,crack}$	Water-filled porosity for soil in cracks	cm^3/cm^3	Equation S20, Appendix C, Table A	0.15
$\Theta_{w,i}$	Water-filled porosity of soil layer i	cm^3/cm^3	Equation S20, Appendix C, Table A For capillary fringe, USEPA, 2004	0.15 or Calculated Value For capillary fringe = 0.375 or $0.9\ \Theta_{T,i}$
ρ_b	Dry soil bulk density	g/cm^3	SSL or Field Measurement Appendix C, Table F	1.5 or Calculated Value

Symbol	Parameter	Units	Source	Tier 1 or Calculated Value
$\rho_{s,i}$	Soil particle density	g/cm^3	Field Measurement, Appendix C, Table F or SSL	2.65 or Calculated Value
ρ_w	Density of water	g/cm^3	Illinois EPA	1

SSL "Technical Background Document for Draft Soil Screening Level Framework, Review Draft", July 1994SSG "Soil Screening Guidance: User's Guide" EPA/540/R-96/018, April 1996
US EPA, 2004a. Users Guide for Evaluating Subsurface Vapor Intrusion into Buildings. February 2004.

(Source: Added at ____ Ill. Reg. _____, effective _____)

STATE OF ILLINOIS)
) ORIGINAL
COUNTY OF SANGAMON)

PROOF OF SERVICE

I, the undersigned, on oath state that I have served the attached Motion for Acceptance, Appearance of Attorney, Certification of Origination, Motion for Leave from Filing Requirement, List of Studies and Reports Used in Regulatory Development, Statement of Reasons, and the Proposed Amendments upon the persons to whom they are directed, by placing a copy of each in an envelope addressed to:

Dorothy Gunn, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 W. Randolph, Suite 11-500
Chicago, Illinois 60601

Bill Richardson
Chief Legal Counsel
Illinois Dept. of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271

Matt Dunn
Environmental Bureau Chief
Office of the Attorney General
James R. Thompson Center
100 W. Randolph, 12th Floor
Chicago, Illinois 60601

and mailing them (First Class Mail) from Springfield, Illinois on September 2, 2008, with sufficient postage affixed as indicated above.

SUBSCRIBED AND SWORN TO BEFORE ME
This 2nd day of September, 2008.

Notary Public

OFFICIAL SEAL
BRENDA BOEHNER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 11-3-2009