

ILLINOIS POLLUTION CONTROL BOARD

June 4, 1998

IN THE MATTER OF:)
)
TIERED APPROACH TO) R97-12(C)
CORRECTIVE ACTION) (Rulemaking - Land)
OBJECTIVES: AMENDMENTS)
TO 35 ILL. ADM. CODE 742)

Adopted Rule. Final Order.

OPINION AND ORDER OF THE BOARD (by M. McFawn, J. Yi):

The Board today adopts amendments to 35 Ill. Adm. Code 742: Tiered Approach to Corrective Action Objectives, also known as TACO. Specifically, the amendments include several technical revisions to Appendix A.Table H, Appendix B.Table C, Appendix B.Table D, and Appendix C.Table I¹ as well as some nonsubstantive clarifications to Sections 742.210, 742.310, and 742.900.

PROCEDURAL HISTORY

On December 3, 1997, in Docket B of this rulemaking, the Site Remediation Advisory Committee (SRAC) and the Illinois Environmental Protection Agency (Agency), filed a “Joint Motion to Correct” (joint motion) Appendix A.Table H entitled “Chemicals Whose Tier 1 Class I Groundwater Remediation Objective Exceeds the 1 in 1,000,000 Cancer Risk Concentration” (Table H). In their joint motion, the SRAC and the Agency asserted that, upon reviewing the numeric contaminant levels set forth under the 1 in 1,000,000 cancer risk concentration included within Table H, they determined that those numeric contaminant levels are based upon a 70-year exposure duration. The SRAC and the Agency maintained that the use of a 70-year exposure duration as a basis for the Table H levels, rather than a 30-year exposure duration, was not intended. Finally, the SRAC and the Agency contended that the use of the 70-year exposure duration as a basis for the Table H levels is technically inconsistent with other aspects of 35 Ill. Adm. Code 742, which are based on a 30-year exposure duration.

At that point in the rulemaking process, the Board could not correct Table H. See 4 ILCS 5/-40(c),(d) (1994). Accordingly, on December 4, 1997, the Board adopted Docket B

¹ At first notice, the Board also opened Appendix B.Table F and Sections 742.415, 742.510, 742.810, and 742.1015 to make nonsubstantive typographical changes. However, upon further review of this matter, the Board determined that no such typographical amendments were necessary. As no other changes were suggested, the Board has not considered any amendments to the aforementioned appendix and sections. Accordingly, they are not included in the attached order.

as final and ordered the rules filed with the Secretary of State. See In the Matter of: Tiered Approach to Corrective Action Objectives: Amendments to Part 742 (December 4, 1997), R97-12(B). Also, on December 4, 1997, the Board adopted a first notice proposal in this docket C to consider the merits of the joint motion and also to make some nonsubstantive grammatical, typographical, and mechanical changes that were identified after the adoption of Docket A in this rulemaking. 21 Ill. Reg. 16982 (December 26, 1997). The joint motion filed in Docket B has been incorporated as public comment 1.

Hearing was held in this matter on January 12, 1998, in Springfield. At hearing, Dr. Thomas Hornshaw and Tracey Virgin Hurley, Environmental Toxicologists with the Office of Chemical Safety, testified on behalf of the Agency. Mark Marszalek testified on behalf of Andrews Environmental Engineering. Harry Walton, Chairman of the Site Remediation Advisory Committee (SRAC), testified on behalf of the Illinois State Chamber of Commerce and on retainer to the Illinois Environmental Regulatory Group (IERG). Whitney Wagner Rosen was present on behalf of the Illinois Environmental Regulatory Group. The first notice public comment period in this matter ended on February 9, 1998. No additional public comments were filed with the Board during the first notice public comment period.

Pursuant to Public Act 90-489, effective January 1, 1998, the Board requested that the Department of Commerce and Community Affairs (DCCA) conduct an economic impact study for this proposed rulemaking. DCCA has 30 to 45 days after such request to produce a study of the economic impact of the proposed rules. On January 26, 1998, DCCA issued a letter notifying the Board that it would not conduct an economic impact study on this proposed rule because it lacked the technical and financial resources to conduct any economic studies on rules pending before the Board during the remainder of fiscal year 1998. On March 17, 1998, the Board conducted a public hearing in Springfield to entertain any comments regarding the economic impact of this proposed rulemaking. No public comments were received.

On April 16, 1998, the Board adopted the amendments for second notice review by the Joint Committee on Administrative Rules (JCAR). On May 19, 1998, JCAR issued a certificate of no objection. Accordingly, the Board adopts the amendments as proposed, including some minor nonsubstantive, stylistic changes suggested by JCAR.

ANALYSIS

Section 742.210

Section 742.210 lists the documents incorporated by reference into the Board's regulations. At first notice, the Board proposed to make one nonsubstantive typographical correction in Section 742.210(a) to the SW-846 reference. At hearing, however, Ms. Hurley testified that in addition to the typographical correction, another revision was necessary to the SW-846 reference. Ms. Hurley testified that on June 13, 1997, Update III to the SW-846 reference was formally adopted (62 Fed. Reg. 32452 (June 13, 1997)). Tr. at 11. By publishing the announcement in the Federal Register, the United States Environmental Protection Agency (USEPA) has made Update III officially part of the SW-846 reference.

The Board agrees that these changes should be made to the SW-846 reference listed at Section 742.210, and therefore makes the necessary revisions in this Section.

Section 742.310

At first notice, the Board on its own motion amended Section 742.310(b)(1)(A) to add the phrase “within ten feet of” after “[t]he concentration of any contaminant of concern” and after “the land surface or.” At hearing, the Board questioned the Agency and public whether it had any opposition to this amendment. Tr. at 18-19. Mr. Hurley responded that the Agency had no such objection and that it was its intent to include that phrase in this Section for clarification purposes. Tr. at 19. Accordingly, the Board adopts these amendments at Section 742.310(b)(1)(A).

Section 742.805

Since first notice, the Agency proposed that the Board amend provisions of Section 742.805 to further clarify how similar-acting contaminants are to be evaluated under this rule. Unfortunately, Section 742.805 was not opened at first notice on December 4, 1997, and the amendments suggested by the Agency after first notice were not the subject of this rulemaking. According to the Administrative Procedure Act, the Board is limited to addressing only sections opened at first notice or otherwise related to those sections. 5 ILCS 100/5-40(b), (c) (1994). Because the Agency’s proposed amendments correctly explain the existing rule, the following discussion is included to assist those individuals using this provision of Part 742.

First, the Agency proposed that Section 742.805(c) be amended to clarify that the equation set forth in Section 742.805(c)(1) should be used for evaluating mixtures of similar-acting noncarcinogenic contaminants of concern. Tr. at 11. Second, the Agency proposed a similar amendment to Section 742.805(d) to clarify that the provisions of subsection (d) should be used for evaluating mixtures of similar-acting carcinogenic contaminants of concern.

Third, the Agency proposed another amendment to subsection (d) that specifies how to assess mixtures of similar-acting carcinogenic contaminants of concern. This amendment would allow the use of the weighted average procedure set forth in Section 742.805(c)(1) with some modification to demonstrate that the cumulative risk posed by mixtures of similar-acting carcinogenic contaminants of concern does not exceed 1 in 10,000. Essentially, the modification to the weighted average equation under Section 742.805(c)(1) would require the term CUO_{xa} in the equation to be either Tier 1 or Tier 2 objectives, or for those contaminants listed in Appendix A.Table H, the 1 in 1,000,000 risk level concentrations.

In response to a Board question regarding the practical effect if these suggested changes are not made, Ms. Hurley testified that the language as it currently exists in Section 742.810 is “just a little vague.” Tr. at 17. She noted that, based on several outside requests for clarification of this Section, absent the proposed clarifications, those using Part 742 may continue to be confused about how to assess mixtures of similar-acting substances and how to use Appendix A.Table H. Tr. at 17-18.

Again, the Board shares the Agency's desire to further clarify the TACO scheme. As now written, Section 742.805 provides the methods for correctly evaluating similar-acting substances. While the clarifications proposed by the Agency might be helpful, we cannot make changes in Section 742.805 now due to rulemaking requirements under the Administrative Procedure Act. The Board suggests that the Agency propose this change in a future rulemaking.

Section 742.900

At first notice, the Board on its own motion, proposed that Section 742.900(c) be amended to make one nonsubstantive, typographical correction. As no one expressed an objection to this suggested change, the Board finds that this change is warranted.

Appendix A.Table H

Appendix A.Table H (Table H) lists chemicals whose Tier 1 Class I groundwater remediation objective exceeds the 1 in 1,000,000 cancer risk concentration. The Agency suggested two corrections be made to Appendix A.Table H.

First, the Agency proposed that the 1 in 1,000,000 cancer risk concentrations be based upon an exposure duration period of 30 years. Currently, the values listed there are based upon a 70-year exposure duration. The Agency explained in its prefiled testimony and at hearing that when it originally calculated the 1 in 1,000,000 cancer risk concentrations in Table H, using Equation R25 as set forth in Section 742.Appendix C.Table C, it used an incorrect exposure duration of 70 years instead of an exposure duration of 30 years, as specified in Section 742.Appendix C.Table D. Tr. at 10 and Prefiled Testimony at 3. The values in Table H should be based on an exposure duration of 30 years, which is the value specified in Appendix C.Table D for Equation R25. Tr. at 10. Both the American Society of Testing Material (ASTM) Guidance and the USEPA's SSL Guidance specify a residential exposure duration of 30 years. Finally, Ms. Hurley testified that the Agency had always intended to calculate these levels based on a 30-year exposure duration. Tr. at 10.

Second, the Agency proposed that three chemicals, namely, Bis(2-ethylhexyl)phthalate, N-Nitrosodiphenylamine, and 2,4,6-Trichlorophenol be deleted from Appendix A.Table H. Tr. at 10. The Agency explained at hearing that after revising the values listed in Table H to reflect a 30-year exposure period, the Tier 1 Class I groundwater remediation objectives for the aforementioned chemicals no longer exceed the 1 in 1,000,000 cancer risk concentrations. Tr. at 10. Consequently, the Agency proposed deleting those chemicals from Table H. Tr. at 10.

Finally, Mark Marszalek testified at hearing that a typographical error should be corrected in Table H for the constituent Benzopyrene. Tr. at 12. Mr. Marszalek explained that the value for Benzopyrene should be 0.000012 rather than 0.0000012. Tr. at 12. The Agency agreed with Mr. Marszalek's suggested change.

The Board agrees with the Agency that a 30-year residential exposure duration is consistent with the Agency's intent, as well as ASTM and USEPA guidance. Accordingly, the cancer risk concentration values listed are corrected in Table H. The Board also agrees that the three aforementioned chemicals should be deleted from Appendix A. Table H as their Tier 1 Class I groundwater remediation objectives no longer exceed the 1 in 1,000,000 cancer risk concentration. Finally, the Board agrees with Mr. Marszalek's testimony that the value for Benzopyrene should be 0.000012 and therefore corrects the value for this chemical. The attached Board order reflects the foregoing revisions.

Appendix B. Table C

Appendix B. Table C lists pH specific soil remediation objectives for inorganics and ionizing organics for the soil component of the groundwater ingestion route (Class I groundwater). The Agency requests that a value for the organic, 2,4,6-Trichlorophenol, be amended to correct a typographical error. Tr. at 13. No objection has been received concerning this proposed correction. The Board finds this nonsubstantive change proper and will correct the typographical error.

Appendix B. Table D

Appendix B. Table D lists pH specific soil remediation objectives for inorganic and ionizing organic chemicals for the soil component of the groundwater ingestion route (Class II groundwater). The Agency requested that the soil remediation objectives for 2,4,6-Trichlorophenol be changed for the six pH ranges ranging from: 4.5-4.74 to 6.65-6.89. Tr. at 14. Dr. Hornshaw testified at hearing that, upon conferring with Mr. Marszalek, he learned that these changes are necessary to account for how the Agency in the past has derived the equivalent of a health advisory for Class II groundwater. Tr. at 15. For those chemicals that do not have a Class II groundwater standard under Part 620, the Class II health advisory is used as a substitute for the Part 620 standard in determining soil remediation objectives.²

The Board agrees that the pH based soil remediation objectives for 2,4,6-Trichlorophenol must be corrected to account for the manner in which the Agency has derived the Class II health advisory. The Board notes that in Appendix C, Table I, the K_{oc} for 2,4,6-Trichlorophenol changes from higher than that of Ethylbenzene at pH of 6.8 to lower than that of Ethylbenzene at pH of 6.9. Therefore, at pH ranges below 6.9, 2,4,6-Trichlorophenol is considered to be removable from groundwater and its Class II health advisory is five times the Class I health advisory. The Board finds that the soil remediation objectives in Appendix B. Table D for 2,4,6-Trichlorophenol must be corrected at pH ranges lower than 6.9 by multiplying them by five.

² For a detailed discussion on determining a Class II health advisory for a chemical, please see the Board's second notice opinion, In the Matter of: Tiered Approach to Corrective Action Objectives: Amendments to 35 Ill. Adm. Code 742, (April 16, 1998), slip op. at 5-6.

Appendix C.Table I

Appendix C.Table I lists K_{oc} values for ionizing organics as a function of pH. The Agency requested that four calculations starting with pH 4.5 to pH 4.8 be amended for the organic chemical, Dinoseb. Tr. at 16. Dr. Hornshaw testified at hearing that these suggested amendments are typographical changes necessary for purposes of clarification. Tr. at 16. The Board agrees with the Agency and accordingly makes the necessary amendments.

CONCLUSION

The Board today adopts amendments to 35 Ill. Adm. Code 742. The amendments include several technical revisions to Appendix A.Table H, Appendix B.Table C, Appendix B.Table D, and Appendix C.Table I, as well as some nonsubstantive clarifications to Sections 742.210, 742.310, and 742.900.

The Board notes that Mr. Marszalek and others have identified various minor typographical and technical discrepancies in Part 742. The Board appreciates these efforts to thoroughly review and identify additional errors within the TACO framework. Unfortunately, as previously noted, the Board is limited under the Administrative Procedures Act. The Board, therefore, cannot make the additional changes suggested at hearing. To the extent that these changes may be necessary, the Board encourages members of the regulated community and the Agency to compile all additional amendments and submit a new proposal for rulemaking to the Board.

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ORDER

The Board directs the Clerk of the Board to cause the publication of the following amendments in the *Illinois Register*:

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

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742.200	Definitions
742.205	Severability
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SUBPART C: EXPOSURE ROUTE EVALUATIONS

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742.310	Inhalation Exposure Route
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742.320	Groundwater Ingestion Exposure Route

SUBPART D: DETERMINING AREA BACKGROUND

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742.400	Area Background
742.405	Determination of Area Background for Soil
742.410	Determination of Area Background for Groundwater
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742.605	Land Use
742.610	Chemical and Site Properties

SUBPART G: TIER 2 SOIL EVALUATION

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742.710	SSL Soil Equations
742.715	RBCA Soil Equations
742.720	Chemicals with Cumulative Noncarcinogenic Effects

SUBPART H: TIER 2 GROUNDWATER EVALUATION

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742.800	Tier 2 Groundwater Evaluation Overview
742.805	Tier 2 Groundwater Remediation Objectives
742.810	Calculations to Predict Impacts from Remaining Groundwater Contamination

SUBPART I: TIER 3 EVALUATION

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742.905	Modifications of Parameters
742.910	Alternative Models
742.915	Formal Risk Assessments

742.920	Impractical Remediation
742.925	Exposure Routes
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SUBPART J: INSTITUTIONAL CONTROLS

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742.1015	Ordinances
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SUBPART K: ENGINEERED BARRIERS

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Table D	Percentage Points of the W Test for $N=3(1)50$
Table E	Similar-Acting Noncarcinogenic Chemicals
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Table K	Parameter Estimates for Calculating Water-Filled Soil Porosity (θ_w)

AUTHORITY: Implementing Sections 22.4, 22.12, Title XVI, and Title XVII and authorized by Sections 27, 57.14, and 58.5 of the Environmental Protection Act [415 ILCS 5/22.4, 22.12, 27, 57.14 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. _____, effective _____.

NOTE: Capitalization indicates statutory language.

SUBPART B: GENERAL

Section 742.210 Incorporations by Reference

- a) The Board incorporates the following material by reference:

ASTM. American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103 (215) 299-5400

ASTM D 2974-87, Standard Test Methods for Moisture, Ash and Organic Matter of Peat and Other Organic Soils, approved May 29, 1987 (reapproved 1995).

ASTM D 2488-93, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), approved September 15, 1993.

ASTM D 1556-90, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method, approved June 29, 1990.

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 2922-91, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth), approved December 23, 1991.

ASTM D 2937-94, Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method, approved June 15, 1994.

ASTM D 854-92, Standard Test Method for Specific Gravity of Soils, approved November 15, 1992.

ASTM D 2216-92, Standard Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock, approved June 15, 1992.

ASTM D 4959-89, Standard Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating Method, approved June 30, 1989 (reapproved 1994).

ASTM D 4643-93, Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method, approved July 15, 1993.

ASTM D 5084-90, Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, approved June 29, 1990.

ASTM D 422-63, Standard Test Method for Particle-Size Analysis of Soils, approved November 21, 1963 (reapproved 1990).

ASTM D 1140-92, Standard Test Method for Amount of Material in Soils Finer than the No. 200 (75 μm) Sieve, approved November 15, 1992.

ASTM D 3017-88, Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth), approved May 27, 1988.

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

ASTM D 2487-93, Standard Test Method for Classification of Soils for Engineering Purposes, approved September 15, 1993.

ASTM E 1527-93, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, approved March 15, 1993. Vol. 11.04.

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

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

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, ~~November 1986~~ [Final Update III, December 1996](#)), as amended by Updates [I](#), [and IIA](#), [and III](#) (Document No. 955-001-00000-1)(contact USEPA, Office of Solid Waste, for Update [HAIII](#)).

"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 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).

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).

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.

"Dermal Exposure Assessment: Principles and Applications", EPA Publication No. EPA/600/8-91/011B (January 1992).

"Exposure Factors Handbook", EPA Publication No. EPA/600/8-89/043 (July 1989).

"Risk Assessment Guidance for Superfund, Vol. I; Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors", OSWER Directive 9285.6-03 (March 1991).

"Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites," EPA Publication No. EPA/600/8-85/002 (February 1985), PB 85-192219.

"Risk Assessment Guidance for Superfund, Volume I; Human Health Evaluation Manual (Part A)", Interim Final, EPA Publication No. EPA/540/1-89/002 (December 1989).

"Risk Assessment Guidance for Superfund, Volume I; Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment Interim Guidance", Draft (August 18, 1992).

"Soil Screening Guidance: Technical Background Document", EPA Publication No. EPA/540/R-95/128, PB96-963502 (May 1996).

"Soil Screening Guidance: User's Guide", EPA Publication No. EPA/540/R-96/018, PB96-963505 (April 1996).

"Superfund Exposure Assessment Manual", EPA Publication No. EPA/540/1-88/001 (April 1988).

RCRA Facility Investigation Guidance, Interim Final, developed by USEPA (EPA 530/SW-89-031), 4 volumes (May 1989).

- b) CFR (Code of Federal Regulations). Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (202) 783-3238:

40 CFR 761.120 (1993).

- c) This Section incorporates no later editions or amendments.

SOURCE: Amended at 22 Ill. Reg. _____, effective, _____.

SUBPART C: EXPOSURE ROUTE EVALUATIONS

Section 742.310 Inhalation Exposure Route

The inhalation exposure route may be excluded from consideration if:

- a) The requirements of Sections 742.300 and 742.305 are met; and
- b) An institutional control, in accordance with Subpart J, is in place that meets the following requirements:
 - 1) Either:
 - A) The concentration of any contaminant of concern within ten feet of the land surface or within ten feet of any man-made pathway shall not exceed the Tier 1 remediation objective under Subpart E for the inhalation exposure route; or
 - B) An engineered barrier, as set forth in Subpart K and approved by the Agency, is in place; and
 - 2) Requires safety precautions for the construction worker if the Tier 1 construction worker remediation objectives are exceeded.

SOURCE: Amended at 22 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 levels 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., as site will be used for recreation in the future and cannot be evaluated in Tiers 1 or 2); and
 - 9) Requests for site-specific remediation objectives which exceed Tier 1 groundwater remediation objectives so long as the following is demonstrated:
 - A) TO THE EXTENT PRACTICAL, THE EXCEEDENCE 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. (Section 58.5(D)(4)(A) of the Act)
- 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. (Section 58.7(e)(1) of the Act). 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.

SOURCE: Amended at 22 Ill. Reg. _____, effective, _____.

Section 742.APPENDIX A: General

TABLE H: 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	0.00004	0.0000025	0.00004
Benzo(a)pyrene	0.0002	0.00001205	0.00023
Bis(2-chloroethyl)ether	0.01	0.0000377	0.01
Bis(2-ethylhexyl)phthalate	0.006	0.00361	0.0027
Carbon Tetrachloride	0.005	0.000366	0.00003
Chlordane	0.002	0.0000366	0.00014
Dibenzo(a,h)anthracene	0.0003	0.00000512	0.0003
1,2-Dibromo-3-chloropropane	0.0002	0.0000361	0.0002
1,2-Dibromoethane	0.00005	0.000000410	0.00005
3,3'-Dichlorobenzidine	0.02	0.0000819	0.02
1,2-Dichloroethane	0.005	0.000494	0.00003
Dieldrin	0.00002	0.00000253	0.00002
Heptachlor	0.0004	0.00000819	0.00003
Heptachlor epoxide	0.0002	0.00000494	0.00032
Hexachlorobenzene	0.00006	0.0000253	0.00006
alpha-HCH	0.00003	0.00000614	0.00003
Tetrachloroethylene	0.005	0.000716	0.00001
Toxaphene	0.003	0.0000377	0.00086
Vinyl chloride	0.002	0.00001545	0.00006
Ionizable Organics			
N-Nitrosodiphenylamine	0.01	0.007	0.01
N-Nitrosodi-n-propylamine	0.01	0.00000512	0.01
Pentachlorophenol	0.001	0.000371	0.001
2,4,6-Trichlorophenol	0.0064	0.003	0.0064
Inorganics			
Arsenic	0.05	0.0000257	0.001
Beryllium	0.004	0.00000832	0.004

SOURCE: Amended at 22 Ill. Reg. _____, effective _____.

Section 742.APPENDIX B: Tier 1 Tables and Illustrations

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 8.0
Inorganics									
Antimony	5	5	5	5	5	5	5	5	5
Arsenic	25	26	27	28	29	29	29	30	31
Barium	260	490	850	1,200	1,500	1,600	1,700	1,800	2,100
Beryllium	1.1	2.1	3.4	6.6	22	63	140	1,000	8,000
Cadmium	1.0	1.7	2.7	3.7	5.2	7.5	11	59	430
Chromium (+6)	70	62	54	46	40	38	36	32	28
Copper	330	580	2,100	11,000	59,000	130,000	200,000	330,000	330,000
Cyanide	40	40	40	40	40	40	40	40	40
Mercury	0.01	0.01`	0.03	0.15	0.89	2.1	3.3	6.4	8.0
Nickel	20	36	56	76	100	130	180	700	3,800
Selenium	24	17	12	8.8	6.3	5.2	4.5	3.3	2.4
Silver	0.24	0.33	0.62	1.5	4.4	8.5	13	39	110

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 8.0
Thallium	1.6	1.8	2.0	2.4	2.6	2.8	3.0	3.4	3.8
Vanadium	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
Organics									
Benzoic Acid	440	420	410	400	400	400	400	400	400
2-Chlorophenol	4.0	4.0	4.0	4.0	3.9	3.9	3.9	3.6	3.1
2,4-Dichlorophenol	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.86	0.69
Dinoseb	8.4	4.5	1.9	0.82	0.43	0.34	0.31	0.27	0.25
Pentachlorophenol	0.54	0.32	0.15	0.07	0.04	0.03	0.02	0.02	0.02
2,4,5-TP (Silvex)	26	16	12	11	11	11	11	11	11
2,4,5-Trichlorophenol	400	390	390	370	320	270	230	130	64
2,4,6-Trichlorophenol	0.37	0.36	0.34	0.269	0.20	0.15	0.13	0.09	0.07

SOURCE: Amended at 22 Ill. Reg. _____, effective _____.

Section 742.APPENDIX B Tier I Tables and Illustrations

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 8.0
Inorganics									
Antimony	20	20	20	20	20	20	20	20	20
Arsenic	100	100	100	110	110	120	120	120	120
Barium	260	490	850	1,200	1,500	1,600	1,700	1,800	2,100
Beryllium	140	260	420	820	2,800	7,900	17,000	130,000	1,000,000
Cadmium	10	17	27	37	52	75	110	590	4,300
Chromium (+6)	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
Cyanide	120	120	120	120	120	120	120	120	120
Mercury	0.05	0.06	0.14	0.75	4.4	10	16	32	40
Nickel	400	730	1,100	1,500	2,000	2,600	3,500	14,000	76,000
Selenium	24	17	12	8.8	6.3	5.2	4.5	3.3	2.4
Thallium	16	18	20	24	26	28	30	34	38
Zinc	2,000	3,600	5,200	7,200	10,000	12,000	15,000	32,000	110,000

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 8.0
Organics									
Benzoic Acid	440	420	410	400	400	400	400	400	400
2-Chlorophenol	20	20	20	20	20	20	19	3.6	3.1
2,4-Dichlorophenol	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.86	0.69
Dinoseb	84	45	19	8.2	4.3	3.4	3.1	2.7	2.5
Pentachlorophenol	2.7	1.6	0.75	0.33	0.18	0.15	0.12	0.11	0.10
2,4,5-TP (Silvex)	130	79	62	57	55	55	55	55	55
2,4,5-Trichlorophenol	2,000	2,000	1,900	1,800	1,600	1,400	1,200	640	64
2,4,6-Trichlorophenol	0.37 <u>1.9</u>	0.36 <u>1.8</u>	0.34 <u>1.7</u>	0.26 <u>1.4</u>	0.20 <u>1.0</u>	0.15 <u>0.77</u>	0.13	0.09	0.07

SOURCE: Amended at 22 Ill. Reg. _____, effective, _____.

Section 742.APPENDIX C: Tier 2 Tables and Illustrations

Section 742.TABLE I: K_{oc} Values for Ionizing Organics as a Function of pH (cm³/g or L/kg)

pH	Benzoic Acid	2-Chloro-phenol	2,4-Dichloro-phenol	Pentachloro-phenol	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	Dinoseb	2,3,5-TP (Silvex)
4.5	1.07E+01	3.98E+02	1.59E+02	1.34E+04	2.37E+03	1.06E+03	3.00E+03 4	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+03 4	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+03 4	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+03 4	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	4.64E+00	3.98E+02	1.59E+02	7.96E+03	2.36E+03	1.03E+03	1.59E+04	7.76E+03
5.1	3.88E+00	3.98E+02	1.59E+02	6.93E+03	2.36E+03	1.02E+03	1.36E+04	7.30E+03
5.2	3.25E+00	3.98E+02	1.59E+02	5.97E+03	2.35E+03	1.01E+03	1.15E+04	6.91E+03
5.3	2.72E+00	3.98E+02	1.59E+02	5.10E+03	2.34E+03	9.99E+02	9.66E+03	6.60E+03
5.4	2.29E+00	3.98E+02	1.58E+02	4.32E+03	2.33E+03	9.82E+02	8.10E+03	6.36E+03
5.5	1.94E+00	3.97E+02	1.58E+02	3.65E+03	2.32E+03	9.62E+02	6.77E+03	6.16E+03
5.6	1.65E+00	3.97E+02	1.58E+02	3.07E+03	2.31E+03	9.38E+02	5.65E+03	6.00E+03
5.7	1.42E+00	3.97E+02	1.58E+02	2.58E+03	2.29E+03	9.10E+02	4.73E+03	5.88E+03
5.8	1.24E+00	3.97E+02	1.58E+02	2.18E+03	2.27E+03	8.77E+02	3.97E+03	5.78E+03
5.9	1.09E+00	3.97E+02	1.57E+02	1.84E+03	2.24E+03	8.39E+02	3.35E+03	5.70E+03

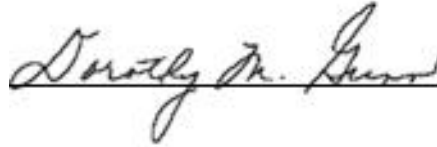
pH	Benzoic Acid	2-Chloro-phenol	2,4-Dichloro-phenol	Pentachloro-phenol	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	Dinoseb	2,3,5-TP (Silvex)
6.0	9.69E-01	3.96E+02	1.57E+02	1.56E+03	2.21E+03	7.96E+02	2.84E+03	5.64E+03
6.1	8.75E-01	3.96E+02	1.57E+02	1.33E+03	2.17E+03	7.48E+02	2.43E+03	5.59E+03
6.2	7.99E-01	3.96E+02	1.56E+02	1.15E+03	2.12E+03	6.97E+02	2.10E+03	5.55E+03
6.3	7.36E-01	3.95E+02	1.55E+02	9.98E+02	2.06E+03	6.44E+02	1.83E+03	5.52E+03
6.4	6.89E-01	3.94E+02	1.54E+02	8.77E+02	1.99E+03	5.89E+02	1.62E+03	5.50E+03
6.5	6.51E-01	3.93E+02	1.53E+02	7.81E+02	1.91E+03	5.33E+02	1.45E+03	5.48E+03
6.6	6.20E-01	3.92E+02	1.52E+02	7.03E+02	1.82E+03	4.80E+02	1.32E+03	5.46E+03
6.7	5.95E-01	3.90E+02	1.50E+02	6.40E+02	1.71E+03	4.29E+02	1.21E+03	5.45E+03
6.8	5.76E-01	3.88E+02	1.47E+02	5.92E+02	1.60E+03	3.81E+02	1.12E+03	5.44E+03
6.9	5.60E-01	3.86E+02	1.45E+02	5.52E+02	1.47E+03	3.38E+02	1.05E+03	5.43E+03
7.0	5.47E-01	3.83E+02	1.41E+02	5.21E+02	1.34E+03	3.00E+02	9.96E+02	5.43E+03
7.1	5.38E-01	3.79E+02	1.38E+02	4.96E+02	1.21E+03	2.67E+02	9.52E+02	5.42E+03
7.2	5.32E-01	3.75E+02	1.33E+02	4.76E+02	1.07E+03	2.39E+02	9.18E+02	5.42E+03
7.3	5.25E-01	3.69E+02	1.28E+02	4.61E+02	9.43E+02	2.15E+02	8.90E+02	5.42E+03
7.4	5.19E-01	3.62E+02	1.21E+02	4.47E+02	8.19E+02	1.95E+02	8.68E+02	5.41E+03
7.5	5.16E-01	3.54E+02	1.14E+02	4.37E+02	7.03E+02	1.78E+02	8.50E+02	5.41E+03
7.6	5.13E-01	3.44E+02	1.07E+02	4.29E+02	5.99E+02	1.64E+02	8.36E+02	5.41E+03

pH	Benzoic Acid	2-Chloro-phenol	2,4-Dichloro-phenol	Pentachloro-phenol	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	Dinoseb	2,3,5-TP (Silvex)
7.7	5.09E-01	3.33E+02	9.84E+01	4.23E+02	5.07E+02	1.53E+02	8.25E+02	5.41E+03
7.8	5.06E-01	3.19E+02	8.97E+01	4.18E+02	4.26E+02	1.44E+02	8.17E+02	5.41E+03
7.9	5.06E-01	3.04E+02	8.07E+01	4.14E+02	3.57E+02	1.37E+02	8.10E+02	5.41E+03
8.0	5.06E-01	2.86E+02	7.17E+01	4.10E+02	2.98E+02	1.31E+02	8.04E+02	5.41E+03

SOURCE: Amended at 22 Ill. Reg. _____, effective _____.

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 4th day of June 1998 by a vote of 7-0.

A handwritten signature in cursive script that reads "Dorothy M. Gunn". The signature is written in black ink and is positioned above a solid horizontal line.

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board