


<b>INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT</b>	<b>STATUS:</b> Effective	<b>POLICY NUMBER:</b> Waste-0046-R2	
<b>AGENCY NONRULE POLICY DOCUMENT</b>  <b>SUBJECT:</b> Risk-based Closure Guide	<b>AUTHORIZED:</b> Brian Rockensuess, Commissioner		
	<b>SUPERSEDES:</b> <i>List previous</i> WASTE-0046-R1	<b>ISSUING OFFICE(S):</b> Office of Land Quality, Remediation Services Branch	
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**Disclaimer:** This Nonrule Policy Document (NPD) is being established by the Indiana Department of Environmental Management (IDEM) consistent with its authority under IC 13-14-1-11.5. It is intended solely to provide guidance and shall be used in conjunction with applicable rules or laws. It does not replace applicable rules and laws, and if it conflicts with these rules or laws, the rules or laws shall control. Pursuant to IC 13-14-1-11.5, this policy will be available for public inspection for at least 45 days prior to presentation to the appropriate State Environmental Board and may be put into effect by IDEM 30 days afterward. If the nonrule policy is presented to more than one board, it will be effective 30 days after presentation to the last. IDEM also will submit the policy to the Indiana Register for publication.

## 1.0 PURPOSE

This Nonrule Policy Document (NPD) exists to facilitate consistent application of Indiana Code (IC) 13-12-3-2 and IC 13-25-5-8.5, which together form the statutory basis for implementation of risk-based closure in Indiana. This NPD sets forth a framework for characterizing releases, evaluating resulting risk, and, where necessary, selecting and implementing appropriate remedies to adequately control release-related risk and allow closure.

## 2.0 SCOPE

This NPD applies to the following remediation programs in IDEM's Office of Land Quality:

1. Petroleum Remediation Section
2. Voluntary Remediation Program (VRP)
3. Resource Conservation and Recovery Act (RCRA) Subtitle C Programs, including RCRA Treatment Storage and Disposal (TSD) facility closures (where such closures are not otherwise governed by statute and/or rule), and RCRA Corrective Action projects.
4. State Cleanup Program (SCP)
5. Indiana Brownfields Program (IBP)

## 3.0 SUMMARY

This NPD describes a series of steps necessary to comply with statutory requirements related to characterization, risk evaluation, remedy selection and implementation, and closure of chemical releases regulated by the remediation programs listed in Section 2.0.

- 3.1. Introduction
- 3.2. Characterization
- 3.3. Identify Release Source(s)
- 3.4. Determine the Nature of Release-Related Chemicals
- 3.5. Determine Extents of Release-related Chemicals
- 3.6. Risk Evaluation
- 3.7. Specify Decision Unit(s) and Their Use(s)
- 3.8. Determine Representative Concentration(s)
- 3.9. Specify Remediation Objectives
- 3.10. Determine Whether a Remedy is Necessary
- 3.11. Remedies

- 3.12. Select and Adequate Remedy
- 3.13. Remedy Implementation and Confirmation
- 3.14. Derivation of IDEM's Published Levels
- 3.15. Background
- 3.16. Quantitative Plume Trend Analysis
- 3.17. Ecological Risk Evaluation
- 3.18. Environmental Restrictive Covenants
- 3.19. Environmental Restrictive Ordinances
- 3.20. Financial Assurance
- 3.21. Acronyms, Initialisms, and Abbreviations
- 3.22. Glossary
- 3.23. References
- 3.24. Index

## **4.0 DEFINITIONS**

- 4.1. "Active Remedy" – A measure which significantly reduces release-related chemical concentrations in a decision unit.
- 4.2. "Adequate Remedy" – A measure which either by itself or in concert with one or more other measures reduces risk from release-related chemicals to an acceptable level for the intended use of a decision unit.
- 4.3. "Agency" – The Indiana Department of Environmental Management (IDEM).
- 4.4. "Aquifer" – An underground geological formation as defined in IC 14-25-7-1.
- 4.5. "Characterization" – A determination of the source, nature, and extents of release-related chemicals.
- 4.6. "Closure" – IDEM's written recognition of a party demonstrating attainment of remediation objectives in an area.
- 4.7. "Code of Federal Regulations (CFR)" – A codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government.
- 4.8. "Commercial indoor air action level" – Ten times a chemical's IDEM published level for commercial indoor air, which corresponds to a carcinogenic risk of  $10^{-4}$  or a hazard quotient of ten, whichever result is the lower concentration.
- 4.9. "Conceptual site model" – A comprehensive understanding of the release, including its setting, characterization, an evaluation of risks associated with the release, and any remedy proposed and implemented to address those risks.
- 4.10. "Conditional closure" – Site closure which includes conditions which must be maintained or performed to effectively control exposure to contaminants.
- 4.11. "Conditional remediation objective" – A remediation objective which does not permit unrestricted use of a decision unit. For example, IDEM's published levels for commercial soil are conditional remediation objectives because they are calculated assuming no residential use.
- 4.12. "Decision unit" – A geographic location in which humans (or organisms) may be exposed to release-related chemicals, which require a decision about whether a remedy for the exposure at the location is necessary.
- 4.13. "Deep soil gas" – Soil gas from more than ten feet below ground surface.
- 4.14. "Delineation" – The act of determining the extents of a chemical release.
- 4.15. "Engineered exposure control" – A physical structure or apparatus which reduces or controls exposure.
- 4.16. "Exempt area" – An area which is not subject to ecological risk evaluation.

- 4.17. "Environmental restrictive covenant (ERC)" – Any deed restriction, restrictive covenant, environmental covenant, environmental notice, or other restriction or obligation with respect to the land, as defined in IC 13-11-2-193.5, which either:
- 1) Is executed before July 1, 2009, and:
    - (A) Limits the use of the land; the activities which may be performed on or at the land; or requires the maintenance of any engineering control on the land designed to protect human health or the environment.
    - (B) By its terms is intended to run with the land and be binding on successors.
    - (C) Is recorded with the county recorder's office in the county in which the land is located.
    - (D) Explains how it can be modified or terminated.
  - 2) Is executed after June 30, 2009, and:
    - (A) Limits the use of the land; the activities which may be performed on or at the land; or requires the maintenance of any engineering control on the land designed to protect human health or the environment.
    - (B) By its terms is intended to run with the land and be binding on successors.
    - (C) Is recorded with the county recorder's office in the county in which the land is located.
    - (D) Explains how it can be modified or terminated.
    - (E) Grants the department access to the land.
    - (F) Requires notice to a transferee of either:
      - (i) The land.
      - (ii) An interest in the land.
 of the existence of the restrictive covenant.
    - (G) Identifies the means by which the environmental files at the department which apply to the land can be located.
- 4.18. "Environmental restrictive ordinance" – As defined in IC 13-11-2-71.2, any ordinance with respect to land, which:
- (1) Is adopted by a municipal corporation (as defined in IC 36-1-2-10).
  - (2) Seeks to control the use of groundwater in a manner and to a degree which protects human health and the environment against unacceptable exposure to a release of hazardous substances or petroleum, or both.
- 4.19. "Extents" – The volume or two-dimensional projection in horizontal space of a volume of media which contains release-related chemicals at concentrations or risk levels exceeding unconditional remediation objectives.
- 4.20. "Indiana Code (IC)" – The codification of laws enacted by the Indiana General Assembly maintained by the Indiana Legislative Council.
- 4.21. "Indiana Department of Environmental Management (IDEM)" – An agency of Indiana State Government whose mission is to implement federal and state regulations to protect human health and the environment while allowing the environmentally sound operations of industrial, agricultural, commercial, and government activities vital to a prosperous economy.
- 4.22. "Line of Evidence" – A fact or set of facts relevant to a decision.
- 4.23. "Naturally occurring background" – Substances present in the environment at concentrations that have not been influenced by human activity (e.g., arsenic in New Albany shale).
- 4.24. "Nature" – The identity and concentrations of release-related chemicals in various media.
- 4.25. "Nonrule policy" - The term assigned by the Indiana Department of Environmental Management (IDEM) to those policies identified in IC 13-14-1-11.5 as any policy which:
- A. Interprets, supplements, or implements a statute or rule.
  - B. Has not been adopted in compliance with IC 4-22-2.
  - C. Is not intended by IDEM to have the effect of law.
  - D. Does not apply solely to the internal IDEM organization (is not an administrative policy).
- 4.26. "Off-site source" – A separate, identifiable, localized source from outside the original location of interest which contributed release-related chemicals to the site (e.g., chlorinated solvents from a dry cleaner impacting a neighboring business which has no history of using those solvents).

- 4.27. "Plume behavior" – How release-related chemical concentrations change spatially and over time, and interact with potential receptors.
- 4.28. "Published level" – A concentration published by IDEM for a chemical in a particular medium which is acceptable for a specific exposure scenario.
- 4.29. "Release-related chemical" – A substance placed on the land or in the subsurface which is, by virtue of its nature or quantity, subject to regulation by IDEM's Office of Land Quality. The term also includes regulated breakdown products.
- 4.30. "Remediation objective" – Per IC 13-25-5-8.5(c), either (1) a concentration of a substance equal to the naturally occurring concentration of that substance on the site, or (2) an environmental concentration of substance which; given the conditions, uses, and restrictions prevailing on the site; is protective of human health and the environment. For purposes of this document, a remediation objective may be a conditional remediation objective or an unconditional remediation objective.
- 4.31. "Remedy" – A means of reducing risk arising from a release-related chemical. Remedies either reduce the concentration of a release-related chemical, reduce exposure to that chemical, or both. An adequate remedy will, either by itself or in concert with one or more other remedies, reduce risk from release-related chemicals to an acceptable level.
- 4.32. "Representative concentration" – An estimate of the concentration of a release-related chemical in a medium within a decision unit.
- 4.33. "Residential indoor air action level" – Ten times a chemical's IDEM published level for residential indoor air, which corresponds to a carcinogenic risk of  $10^{-4}$  or a hazard quotient of ten, whichever results in a lower concentration.
- 4.34. "Rule" – The whole or any part of an agency statement of general applicability which: (1) has or is designed to have the effect of law; and (2) implements, interprets, or prescribes: (A) law or policy; or (B) the organization, procedure, or practice requirements of an agency.
- 4.35. "Safe Drinking Water Act (SDWA)" – The act originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources, such as rivers, lakes, reservoirs, springs, and ground water wells.
- 4.36. "Shallow soil gas" – Soil gas from no more than five feet below ground surface.
- 4.37. "Site" – (1) The geographical area where environmental chemical of concern evaluation is desired. The site may consist of an entire facility and surrounding property or a single area of concern within a facility or property, depending upon the applicable regulatory program. (2) For the purposes of IC 13-25-5, site means a parcel of real property for which an application has been submitted under IC 13-25-5-2. (3) The geographical area being inspected. The site may consist of an entire facility or a single area of concern within the facility or property.
- 4.38. "Source area" – Where release-related chemicals are present in one phase at concentrations high enough to enable them to readily transfer to a different phase at concentrations which require a remedy.
- 4.39. "Source facility" – The building, land, or enterprise used for one or more purposes (e.g., gasoline sales and storage, dry cleaning, manufacturing, etc.) where the release occurred.
- 4.40. "Source mass" – The mass of release-related chemicals in a source area.
- 4.41. "Source point" – The physical location where release-related chemicals first entered the environment.
- 4.42. "Unconditional closure" – A closure which does not require an ongoing remedy.
- 4.43. "Unconditional remediation objective" – A remediation objective which permits unrestricted use of a property. Examples include IDEM's published levels for residential exposure scenarios, naturally occurring background levels, or project-specific residential levels.

- 4.44. "U.S. Environmental Protection Agency (U.S. EPA)" – An agency of the federal government charged with protecting human health and with safeguarding the natural environment: air, water, and land.
- 4.45. "Volatile organic chemical" – A chemical having a vapor pressure greater than one millimeter of mercury at standard conditions.

## 5.0 ROLES

- 5.1 The consultant shall:
- Represent the responsible party.
  - Prepare workplans or other documents for a site on behalf of a responsible party.
  - Coordinate activities with the IDEM State Cleanup project manager to achieve closure of a site.
  - Submit plans, data, and documents as requested by the State Cleanup project manager.
  - Perform investigatory and/or remediation work as described in the work plans or other documents.
- 5.2 The IDEM attorney shall:
- Draft and/or review legal documents, other project related documents, and correspondence, as needed.
  - Advise IDEM OLQ project managers and IDEM management.
  - Refer cases to the Indiana Attorney General, when necessary.
- 5.3 The IDEM Remediation Services Branch chief shall:
- Approve many documents such as letters to, and agreements with responsible parties and participants.
  - Assist State Cleanup project managers in the resolution of issues which arise relative to a site, as needed.
- 5.4 The IDEM Science Services Branch staff shall:
- Provide expertise and services in fields including, but not limited to, chemistry, geology, geological information systems, engineering, and risk assessment.
  - Review work plans and reports.
  - Perform field oversight of investigation or remediation activities, as needed.
  - Provide sampling expertise.
  - Evaluate the quality of the environmental data.
  - Develop and maintain electronic databases.
  - Participate in meetings and discussions with responsible parties, consultants, or the public, as needed.
- 5.5 The IDEM project manager shall:
- Coordinate and implement remediation activities with the responsible party and the consultant.
  - Receive, evaluate, and provide comments on documents associated with the investigation, remediation, and closure of a site.
  - Prepare correspondence to the responsible party and consultant which communicates the status of the remediation project.
  - Request technical staff review of remediation documents and incorporate the technical staff suggestions and comments into the correspondence to the responsible party and the consultant.
  - Conduct internal team meetings with technical staff to discuss the site.
  - Conduct meetings with the responsible party or the consultant to discuss approaches to the remediation or closure of a site.
  - Make decisions on the appropriate use of technology or remediation techniques at the site.
  - Conduct site visits as requested or necessary to view the nuances of the site.
  - Evaluate different proposals on their merit.

- 5.7 The responsible party shall:
- Prepare, or hire a consultant on their behalf to prepare investigation reports, remediation work plans, and progress reports for presentation to the IDEM project manager regarding the characterization and remediation of a site.
  - Respond to IDEM project manager in a timely manner to all requests for information.
  - Provide data, maps, or records to the IDEM project manager reflecting site conditions.

## 6.0 POLICY

- 6.1 IDEM will provide oversight of characterization, risk evaluation, and remedy selection and implementation for releases subject to regulation by those programs.
- 6.2 Perform tasks as described in the Risk-based Closure Guide and submit reports demonstrating the successful performance of those tasks.
- 6.3 IDEM will review environmental investigation, remediation, and closure documentation; conduct site visits; attend meetings; coordinate technical reviews; and coordinate legal review.
- 6.4 The Risk-based Closure Guide (attachment) provides additional detail.

## 7.0 REFERENCES

### 7.1. Federal Laws or Rules:

- A. [40 CFR 260](#) Hazardous Waste Management System – General
- B. [40 CFR 261](#) Identification and Listing of Hazardous Waste
- C. [40 CFR 262](#) Standards Applicable to Generators of Hazardous Waste
- D. [40 CFR 263](#) Standards Applicable to Transporters of Hazardous Waste
- E. [40 CFR 264](#) Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
- F. [40 CFR 265](#) Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
- G. [40 CFR 266](#) Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- H. [40 CFR 267](#) Standards for Owners and Operators of Hazardous Waste Facilities Operating Under a Standardized Permit
- I. [40 CFR 268](#) Land Disposal Restrictions
- J. [40 CFR 270](#) U.S. EPA Administered Permit Programs: The Hazardous Waste Permit Program
- K. [40 CFR 300](#) National Oil and Hazardous Substances Pollution Contingency Plan

### 7.2. Indiana Statutes:

- A. [IC 5-14-3-4](#) Records and recordings exempted from disclosure; time limitations; destruction of records
- B. [IC 13-11-2-71.2](#) Definition of Environmental restrictive ordinance
- C. [IC 13-11-2-193.5](#) Definition of Restrictive covenant
- D. [IC 13-11-2-265](#) Definition of Waters
- E. [IC 13-12-3-2](#) Remediation and closure goals, objectives, and standards for certain remediation projects

- F. [IC 13-14-1-11.5](#) Use by department of policy or statement; presentation to appropriate board; public dissemination
  - G. [IC 13-14-2-2](#) Entry upon private or public property for inspection by agent
  - H. [IC 13-14-2-6](#) Court actions by commissioner
  - I. [IC 13-14-2-8](#) Certain restrictive covenants not subject to department approval; department review and action on certain activities and land use restrictions
  - J. [IC 13-14-2-9](#) Modification of restrictive covenants; recovery of expenses incurred
  - K. [IC 13-23-13-12](#) Duty of owner or operator to furnish information, conduct testing, or permit access; right of entry
  - L. [IC 13-24-1-6](#) Enforcement; testing; facility site right of entry; inspection; reasonable promptness
  - M. [IC 13-25-4-6](#) Entry for inspection by agent; reasonable promptness; samples
  - N. [IC 13-25-4-24](#) Contaminated property; restrictive covenants
  - O. [IC 13-25-5-7](#) Voluntary remediation investigation plan; voluntary remediation work plan; contents
  - P. [IC 13-25-5-8.5](#) Voluntary remediation work plan objectives; additional action to protect human health and the environment not necessary under certain circumstances; risk-based remediation objectives and proposals
  - Q. [IC 14-25-7-1](#) Definition of Aquifer
  - R. [IC 36-1-6-11](#) Notices to department of environmental management concerning environmental restrictive ordinances; waiver of notice; ordinance must state notice requirements, but is not void for failure to state
  - S. [IC 36-1-2-10](#) Definition of Municipal Corporation
  - T. [IC 36-4-6-17](#) Ordinance adoption; recording; contents of record; effect as evidence
  - U. [IC 36-5-2-10.2](#) Recording of adopted ordinance; presumptive evidence
- 7.3. Indiana Administrative Codes:
- A. [312 IAC 13](#) Water Well Drillers and Water Well Pump Installers
  - B. [327 IAC 2](#) Water Quality Standards
  - C. [328 IAC 1](#) Excess Liability Trust Fund Corrective Action and ELTF Liability Indemnity Claim Payments
  - D. [329 IAC 1](#) Solid Waste Management General Waste Provisions
  - E. [329 IAC 3.1](#) Hazardous Waste Management Permit Program and Related Hazardous Waste Management
  - F. [329 IAC 9](#) Underground Storage Tanks
  - G. [329 IAC 10](#) Solid Waste Land Disposal Facilities
  - H. [329 IAC 11](#) Solid Waste Processing Facilities
  - I. [329 IAC 11.5](#) Biomass Anaerobic Digestion Facilities and Biomass Gasification Facilities
  - J. [329 IAC 11.6](#) Mobile Home Salvaging Facilities
  - K. [329 IAC 11.7](#) Alternative Fuel Source
  - L. [329 IAC 15](#) Waste Tire Management
  - M. [329 IAC 16](#) Electronics Waste Management

#### 7.4. Agency Policies:

- A. [Waste-0053](#) Drilling Procedures and Monitoring Well Construction Guidelines
- B. [Waste-0057](#) Sampling and Analysis of Ground Water for Metals at Remediation Sites
- C. [Waste-0070](#) Community Involvement Plan
- D. [Waste-0071](#) Supplemental Sampling Guidance
- E. [Waste-0072](#) Supplemental Characterization Guidance
- F. [Waste-0074](#) Supplemental Guidance on Engineered Exposure Controls

#### 7.5. Other U.S. EPA Sources

- A. U.S. EPA. 1989. [Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual \(Part A\)](#). Office of Emergency and Remedial Response. EPA/540/1-89/002. December 1989.
- B. U.S. EPA. 1991. [Description and Sampling of Contaminated Soils. A Field Pocket Guide](#). EPA/625/12-91/002. November 1991. U.S. Environmental Protection Agency.
- C. U.S. EPA. 1991b. [Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions](#). Office of Solid Waste and Emergency Response. OSWER Directive 9355.0-30.
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- G. U.S. EPA. 1992b. [Guidelines for Exposure Assessment](#). Risk Assessment Forum, U.S. Environmental Protection Agency. EPA/600/Z-92/001. Also in *Federal Register* 57(104):22888-22938.
- H. U.S. EPA. 1992c. [Guidance on Risk Characterization for Risk Managers and Risk Assessors](#). Office of the Administrator. February 26, 1992.
- I. U.S. EPA. 1994. [Method 1312: Synthetic Precipitation Leaching Procedure](#). Part of Hazardous Waste Test Methods / SW-846. U.S. Environmental Protection Agency.
- J. U.S. EPA. 1994b. [Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities](#). OSWER Directive 9355.4-12. U.S. Environmental Protection Agency.
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- A. U.S. EPA. 1995. [Land Use in the CERCLA Remedy Selection Process](#). Office of Soil Waste and Emergency Response. OSWER Directive 9355.7-04.
- L. U.S. EPA. 1996. [Soil Screening Guidance: User's Guide](#). Office of Solid Waste and Emergency Response. Publication 9355.4-23.
- M. U.S. EPA. 1996b. [Soil Screening Guidance: Technical Background Document](#). Office of Emergency and Remedial Response. EPA/540/R-96/019.
- N. U.S. EPA. 2000. [Guidance for Data Quality Assessment: Practical Methods for Data Analysis](#). EPA QA/G-9. QA00 UPDATE. EPA/600/R-96/084.



- O. U.S. EPA. 2000b. [Supplementary Guidance for Conducting Health Risk Assessment of Chemical Mixtures](#). Risk Assessment Forum. EPA/630/R-00/002.
- P. U.S. EPA. 2000c. [Science Policy Council Handbook: Risk Characterization](#). Office of Science Policy. EPA 100-B-00-002. December 2000.
- Q. U.S. EPA. 2001. [Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual](#). EPA-823-B-01-002.
- R. U.S. EPA. 2002. [Guidance on Environmental Data Verification and Data Validation](#). EPA QA/G-8. EPA/240/R-02/004.
- S. U.S. EPA. 2002b. [Guidance for Quality Assurance Project Plans](#). EPA QA/G-5. EPA/240/R-02/009.
- T. U.S. EPA. 2002c. [Guidance on Choosing a Sampling Design for Environmental Data Collection](#). EPA QA/G-5S. EPA/240/R-02/005.
- U. U.S. EPA. 2002d. [Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites](#). Office of Solid Waste and Emergency Response. OSWER 9355.4-24.
- V. U.S. EPA. 2002e. [Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites](#). Office of Emergency and Remedial Response. EPA 540-R-01-003. OSWER 9285.7-41.
- W. U.S. EPA. 2003. [Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil](#). EPA-540-R-03-001.
- X. U.S. EPA. 2003b. [Superfund Lead-Contaminated Residential Sites Handbook](#). OSWER 9285.7-50.
- Y. U.S. EPA. 2004. [Risk Assessment Guidance for Superfund Volume I - Human Health Evaluation Manual \(Part E, Supplemental Guidance for Dermal Risk Assessment\) Final](#). EPA/540/R/99/005.
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- AA. U.S. EPA. 2005b. [Guidelines for Carcinogen Risk Assessment](#). Risk Assessment Forum. EPA/630/P-03/001B.
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- EE. U.S. EPA. 2006c. [Biological Technical Assistance Group \(BTAG\) Screening Values](#).
- FF. U.S. EPA. 2007. [User's Guide for the Integrated Exposure Uptake Biokinetic Model for Lead in Children \(IEUBK\) Windows®](#). Office of Superfund Remediation and Technology Innovation. EPA 9285.7-42.
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- HH. U.S. EPA. 2007c. [Guidance for Evaluating the Oral Bioavailability of Metals in Soils for Use in Human Health Risk Assessment](#). OSWER 9285.7-80.

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- JJ. U.S. EPA. 2009b. [Risk Assessment Guidance for Superfund – Volume I: Human Health Evaluation Manual \(Part F, Supplemental Guidance for Inhalation Risk Assessment\)](#). Office of Superfund Remediation and Technology Innovation. EPA-540-R-070-002. OSWER 9285.7-82.
- KK. U.S. EPA. 2011. [Exposure Factors Handbook](#). EPA/600/R-09/052F (some chapters have more recent updates).
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**8.0 SIGNATURES**



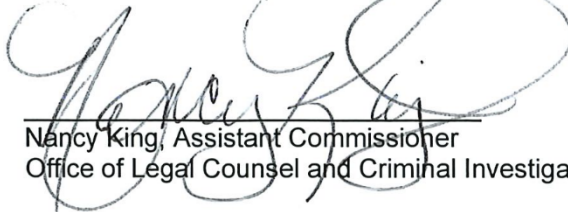
Brian C. Rockensuess, Commissioner  
Indiana Department of Environmental Management

2/16/22  
Date



Peggy Dorsey, Assistant Commissioner  
Office of Land Quality

2/8/22  
Date



Nancy King, Assistant Commissioner  
Office of Legal Counsel and Criminal Investigations

2/10/22  
Date

This policy is consistent with agency requirements.



Quality Assurance Program, Office of Program Support  
Indiana Department of Environmental Management

17 Feb 2022  
Date