

# **Examination of Risk-Based Screening Values and Approaches of Selected States**

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**Prepared by  
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Risk Assessment Resources Team**

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## EXECUTIVE SUMMARY

The Interstate Technology Regulatory Council (ITRC) Risk Assessment Resources Team, formed in 2003, aspires to provide state and federal agencies as well as the interested parties with resources that will act as an aid during the risk assessment and risk management process. The ITRC Risk Assessment Resources Team (Risk Team) prepared this document *Examination of Risk-Based Screening Values and Approaches of Selected States* (henceforth called *State Screening Values*) to provide information on the different methods used by regulatory agencies to develop and apply screening values for evaluating contaminated media. The main objective of the ITRC Risk Team study was to document and analyze the differences among selected states for the screening values used to evaluate contaminants in groundwater, surface water, and soil in residential and industrial land use scenarios. This effort was undertaken to understand the basis for the development of the various criteria and to assess how these criteria are utilized. The Risk Team focused on examining and documenting the various screening values for five specific contaminants that are often identified as drivers for management actions at contaminated sites. The approach followed was to document the differences, if any, among states for each of the selected chemicals and to explore the potential sources of variation in calculation. Additionally, the team researched how the screening values were applied in each state for various media and land-use scenarios.

Screening values, intended to be protective of human health and/or the environment, are often defined as chemical concentrations in environmental media below which no additional regulatory attention is warranted. If chemical concentrations at a site exceed the screening values, then additional investigation or evaluation of that chemical is warranted. Risk-based screening values are derived from equations combining exposure assumptions with toxicity data. The US Environmental Protection Agency's (EPA) Soil Screening Guidance (EPA 1996) provides a standard methodology to calculate risk-based soil screening levels for contaminants in soils that may be used to identify areas needing further investigation. Generic screening values are available for chemicals in various media. Screening values for a specific chemical may vary among states and even among different regions of EPA. Several explanations exist for these discrepancies among screening values, including differences regarding what constitutes a health-protective target risk level.

The ITRC Risk Team developed a questionnaire to query different states and agencies about their methodology for determining risk-based concentrations and establishing standards for chemicals in water and soil. Eleven of the thirteen states examined in this study were chosen because regulators from those states are members of the ITRC Risk Team and were able to provide information about their agency's approach to developing and/or adopting risk-based screening values. The states that participated include: Alabama, Arkansas, California, Colorado, Florida, Georgia, Kansas, Nevada, Oklahoma, South Carolina, and Tennessee. Two additional states, Kentucky and Michigan, were included in the study. Five different constituents were chosen based on the interests of the ITRC Risk Team, and the prevalence of these chemicals at hazardous waste sites. The constituents selected were arsenic, benzo(a)pyrene, lead, polychlorinated biphenyls, and trichloroethene.

*State Screening Values* is a summary and analysis of data collected in the ITRC Risk Team survey. It is evident that there is variability in each state's basis and intended use of the screening values. Although data has been collected regarding screening criteria from multiple media, the detailed analysis presented here focuses on soil and groundwater screening criteria. In some cases, the variability is minimal, while in others the variability may be large (e.g., greater than an order of magnitude). The minimal differences among states' published screening values may be explained by rounding of values or other small differences in the input parameters; however, published screening levels for a chemical can differ from state to state by several orders of magnitude and the reasons for these differences are not always apparent.

Throughout this study, it became clear that the developer of a particular set of screening values must publish the rationale behind each screening value and the intended uses for the screening values (along with any restrictions). A clear and well described rationale can prevent the use of screening values in situations for which they were not intended (for example, the use of a value intended to protect workers should not be used at a site being considered for a future child care center). Transparency and additional guidance also increases the confidence of the regulated community, stakeholders, and the regulators in screening values. This report highlights the need for transparency of methodologies to develop screening values and their application at contaminated sites.

## **ITRC DISCLAIMER**

This Report is based on the ITRC Risk Team survey conducted in Spring 2004. Most of the numerical data from the States has been through Quality Assurance checks in Fall 2004 and Spring 2005, but additional information summarized from the Survey in the Appendix B of this Report that may not have been updated. The ITRC Risk Team has made every attempt to ensure accuracy of information as reported in the survey but the ITRC takes no responsibility for updating this information.