

Overview of Superfund Background Guidance

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Jayne Michaud

U.S. EPA Office of Emergency and Remedial
Response

Introduction

- Purpose of this session.
 - Presenting overview of new Superfund guidance.
- History
 - Characterizing Background Chemicals at Superfund Sites is a Superfund Risk Reform (1997 through 2002)
- Goals of new guidance
 - Ensure reliable representation of background concentrations
 - Promote national consistency
 - Clarify existing guidance

New Products

- Two Products:
 - Draft Technical Guidance for Soil Chemicals
 - www.epa.gov/superfund/programs/risk/background.pdf
 - National Policy Statement (2000-2002)
 - Anticipate OSWER release May 2002

Background Defined

- Background refers to substances or locations that are not influenced by the releases from a site, and is usually described as naturally occurring or anthropogenic.
 - EPA, 1989. Risk Assessment Guidance for Superfund (RAGS)
 - EPA, 1995. Engineering Forum Issue Paper: Determination of Background Concentrations of Inorganics in Soil and Sediments at Hazardous Waste Sites

Why is Background an Issue ?

- Superfund addresses releases of hazardous substance, pollutants and contaminants.
- Contamination found at sites might include background unrelated to the releases.
- Therefore, EPA often needs to consider background contribution when determining appropriate CERCLA actions.

Pop Quiz

Hypothetical Industrial Site

- *Sufficient* site and background sampling data from *appropriate* locations are available.
- Arsenic, Dieldrin, 4,4-DDT are the chemicals of potential concern, i.e.,
 - All exceed Soil Risk-based Concentrations.
 - All may pose unacceptable risks to human health.

Pop Quiz (cont'd)

- Dieldrin is the only known site contaminant.
- Background data confirm:
 - Arsenic is natural and not a released contaminant
 - DDT is an area-wide background contaminant
- Q1. Which are considered in the risk assessment?
- Q2. Which are important for risk management?

Pop Quiz (cont'd)

- A1. All should be *considered* in risk assessment.
 - Dieldrin is known site release; risks are quantified.
 - Arsenic concentrations exceed risk-based levels and should be *discussed* in the risk characterization along with supporting background data.
 - 4,4-DDT risks should be quantified and presented in the risk characterization separately, along with supporting background data.

Pop Quiz (cont'd)

- **A2. All three are important to risk managers.**
 - Dieldrin → cleanup level (release)
 - Arsenic → possible risk communication issue (natural background)
 - 4,4-DDT → possible risk communication issue and a potential area-wide response issue (anthropogenic)
 - manager may consider whether other regulatory programs or authorities can address area-wide issue.
 - See EPA, 1996. Soil Screening Guidance

Details of the Background Guidance and Policy

- **Draft Technical Guidance**
 - *Guidance for Characterizing Background Chemicals in Soil at Superfund Sites*
- **National Policy Statement**
 - *Role of Background in the CERCLA Cleanup Program*

Technical Guidance Goal

- To address the need for reliable representation of background concentrations to support site-specific decisions
 - Encourages sufficient sampling efforts and appropriate statistical methods
 - Follows DQO process
 - Provides options for different datasets
 - Explains implications of statistical inputs

Technical Guidance: Sampling and Analysis

- Use of PA/SI Data for background evaluation
 - Generally limited quantity; need sample locations
- Additional background samples generally needed when:
 - Insufficient numbers for statistical analysis
 - Inappropriate locations
 - Unknown data quality
 - Alterations in land since samples collected
 - Data gaps

Technical Guidance Implementation

- Encourages site-specific background data
- Requires statistical support

Goals of Policy Statement

- Encourage national consistency and clarity in risk assessment, risk management
- Present thorough picture of risks for all stakeholders
- Avoid omission of potential release-related constituents from risk assessment

Overarching Principle

At CERCLA sites, background informs

- risk assessment
- risk management
- risk communication

Background in Risk Assessment

- Includes COPCs* that exceed risk-based screening levels.
- Risk Characterization discusses elevated background and contribution to site risks.
- Risk Characterization discusses naturally occurring elements that are not CERCLA releases, but exceed risk-based screening levels.

*COPC = chemical of potential concern

Background in Risk Management

- Generally, under CERCLA, clean-up levels are not set at concentrations below background.
- However, where area-wide contamination may pose risks but is beyond CERCLA authority, a coordinated response may be achieved.
 - See Rules of Thumb for Remedy Selection (EPA,1997)

Background in Risk Communication

- Some risks, such as background, might not be addressed by the CERCLA action, but are still important to those potentially exposed (EPA, 1989 RAGS).
- Present risks in risk characterization.
- Coordinate risk communication efforts with public health agencies.
- Proactively communicate CERCLA constraints, limitations.

Summary

- New tools to promote consistency, encourage sufficient data collection for background comparisons.
- Requires statistical support.
- Consistent with general Superfund policy to avoid creating “clean islands”, but to consider comprehensive, coordinated response for area-wide contamination.
- In the end, decisions consider ARARs based on “background” and nine criteria provided in the NCP.

Discussion

Case 1 ABC Industrial Site, Soil

- Risks quantified for any COPCs that exceed risk-based concentrations (RBCs).
- Risk drivers (COPCs at high end or exceed risk range or exceed HQ of 1.0) are:
 - Arsenic (suspected natural)
 - Dieldrin
 - 4,4-DDT (suspected area-wide contaminant)
- Site-specific background data show:
 - Arsenic is inconsistent with natural background
 - DDT is consistent with area-wide background

Case 1 ABC Industrial Site, Soil (cont'd)

Therefore, COCs for which cleanup levels should be derived are arsenic and dieldrin.

The risk characterization should also include:
information about DDT as an area-wide background contaminant that is unrelated to releases at this site.

RPM should consider whether other regulatory programs or authorities are able to address the area-wide DDT contamination in a coordinated response effort.

Case 2, ABC Radium Production Site, Soil

- Radium (Ra-226) and inorganic metals detected
- Only Ra-226 and Arsenic exceed RBCs
 - As (suspected natural based on published regional soil data)
 - Ra-226 (a site release, but also naturally occurring)
- Site-specific background analysis confirms :
 - As consistent with background concentrations in soils
 - Ra-226 background high, but is below site levels

Case 2, ABC Radium Production Site (cont'd)

- Risk assessment
 - Quantified for Ra-226 and risks are at high end of risk range
 - The Risk Characterization should include:
 - Discussion of natural background arsenic because concentrations may pose risks ($>$ rbc)
 - Discussion of background Ra-226 because levels may pose risks ($>$ rbc)
- COC = Ra-226 (a cleanup goal should be derived)

Case 3 XYZ Site, soil, gw

- Sources uncertain. Preliminary site data show:
 - Arsenic, manganese, and Ra-226 exceed risk-based levels.
 - Site disposal activities caused naturally occurring arsenic in soil to be mobilized and leach to groundwater.
 - Background data confirm
 - Manganese consistent with background gw levels
 - Ra-226 consistent with background locations
 - Therefore: Mn and Ra-226 are not carried through the quantitative risk assessment

Case 3 XYZ Site, soil, gw (cont'd)

- Risk assessment
 - Arsenic gw risks are at high end of risk range or exceed risk range.
 - Risk characterization should include a discussion of natural Ra-226, manganese
- COC = arsenic; a cleanup goal should be derived.