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# Development of Draft Recommended Interim Preliminary Remediation Goals for Dioxin in Soil

## What is a PRG?

Preliminary remediation goals (PRGs) are chemical-specific concentration goals for specific media (e.g. soil, sediment, water and air) and land use combinations at Superfund, Federal Facilities, Brownfields and RCRA sites. They serve as a target to use during the initial development, analysis, and selection of cleanup alternatives. These goals should both be protective of human health and the environment and comply with all applicable, relevant and appropriate regulations (ARARs) for all exposure pathways being addressed.

In May 2009, the U.S. Environmental Protection Agency's (EPA) Administrator Lisa P. Jackson directed EPA to accelerate work underway to reassess the human health risks from exposures to dioxin including completing the development of draft interim preliminary remediation goals (PRGs) for dioxin in soil. Following through on that commitment, EPA has developed the draft interim PRGs and is requesting public comment. EPA began taking public comment on the draft interim PRGs on January 7, 2010, and will accept comments for 50 days. EPA anticipates issuing the final interim PRGs in June 2010. To offer comments, go to: <http://www.regulations.gov> and enter docket ID number: EPA-HQ-SFUND-2009-0907.

- ["EPA has extended the comment period on the draft recommended interim PRG guidance to April 2, 2010."](#)
- ["Guidance on Recommended Interim Preliminary Remediation Goals for Dioxin in Soil at Comprehensive Environmental Response, Compensation, and Liability Act \(CERCLA\) and Resource Conservation and Recovery Act \(RCRA\) Sites" \(PDF\) \(45pp, 166K, \[About PDF\]\(#\)\) \(December 2009\)](#)

## Supporting documents:

- ["Review of International Soil Levels for Dioxin" \(PDF\) \(17pp, 109K, \[About PDF\]\(#\)\) \(December 2009\) \[Appendix \\(XLS\\)\]\(#\) \(8 worksheets, 144K\)](#)
  - Provides a review of foreign nations' evaluation of the toxicity of dioxin and their established concentration values in soil that are intended to provide protection to humans who may be exposed under residential or commercial/industrial land uses.
- ["State Soil Cleanup Levels for Dioxin" \(December 2009\)](#)
  - Summarizes a review of state soil cleanup levels for dioxin and characterizes the science underlying the values.
- [Federal Register notice \(PDF\) \(3pp, 50KB, \[About PDF\]\(#\)\) \(January 2010\)](#)
  - Provides notice that EPA is seeking comments on the draft "Guidance on Recommended Interim Preliminary Remediation Goals for Dioxin in Soil at Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) Sites."
- [Federal Register notice \(PDF\) \(2pp, 51KB, \[About PDF\]\(#\)\) \(February 2010\)](#)
  - Provides notice that EPA has extended the comment period on the draft recommended interim PRG guidance to April 2, 2010

## Interim Soil Dioxin PRG Outreach

["Plan for Developing Interim Preliminary Remediation Goals for Dioxin \(PDF\)" \(4pp, 198K, \[About PDF\]\(#\)\) \(October 2009\)](#)

Describes EPA's approach for developing interim preliminary remediation goals for dioxin in soil at hazardous

waste sites. EPA is no longer accepting comments on the plan, but the comments that EPA received on it can be viewed at: <http://www.regulations.gov>; docket number: EPA-HQ-SFUND-2009-1002.

## Frequently Asked Questions

### How are PRGs Used?

Consistent with the National Contingency Plan,(4) PRGs generally are initial chemical-specific concentration goals for specific media (e.g. soil, sediment, water and air) and land uses at Superfund, Federal Facilities, Brownfields and RCRA sites. These goals normally should both be protective of human health and the environment and comply with all applicable, relevant and appropriate regulations (ARARs) for all exposure pathways being addressed.

Risk-based PRGs generally are developed using estimates for the toxicity of a chemical, as well as generic exposure assumptions. An example of an exposure assumption is exposure frequency, or the number of days in a year that a person is exposed to contamination. A generic exposure frequency of 350 days per year is typically used for Superfund, Federal Facilities, Brownfields, and RCRA sites for residential settings.

A PRG is usually calculated for cancer and for non-cancer effects. The more conservative value typically is then selected as the recommended PRG. PRGs for carcinogens commonly are set at levels that correspond to one in a million (1 x 10<sup>-6</sup>) individual excess cancer risk (5) as a point of departure. However, they may be revised to a different risk level within the acceptable risk range of 10<sup>-6</sup> to 10<sup>-4</sup> based on consideration of exposure factors, uncertainty, or technical issues. PRGs for non-carcinogens are typically set at a level corresponding to a hazard quotient (6) equal to 1.0.

It is important to note that PRGs are not intended to act as site-specific cleanup levels; rather they are intended to serve as initial guidelines for use in scoping characterization and remediation alternatives at Superfund, Federal Facilities, Brownfields, and RCRA sites. Final cleanup levels for a site typically would be developed by modifying the PRGs based on consideration of site specific factors (e.g., exposure frequency or acceptable cancer risk level).(7)

For specific information on how PRGs are calculated, see EPA's [Risk Assessment Guidance for Superfund \(RAGS\)](#) Part B, Chapter 1 and Chapter 3.

### What are the current PRGs for dioxin in soil?

For Superfund, Federal Facilities, Brownfields, and RCRA sites, OSWER's 1998 soil dioxin guidance (2) recommends a PRG of 1 ppb (or 1,000 ppt) for dioxin toxicity equivalents (TEQs) (3) in residential soil, and a level within the range of 5 ppb (or 5,000 ppt) and 20 ppb (or 20,000 ppt) in commercial/industrial soil, where exposure is due to direct contact. A range in levels has been recommended for commercial/industrial soil due to the greater variability in human exposures associated with these land uses.

The currently recommended PRGs are based on an EPA dioxin toxicity value adopted by the Agency in 1985. This toxicity value is considered a Tier 3 toxicity value under the 2003 OSWER memorandum on the hierarchy of sources of toxicological information (8) that should be considered for site-specific risk assessments (the interim recommended PRGs will also be based on a Tier 3 toxicity value.) The categories for toxicity values are as follows:

- Tier 1- EPA's Integrated Risk Information System (IRIS) (9)

- Tier 2- EPA's Provisional Peer-Reviewed Toxicity Values (PPRTVs) – The Office of Research and Development/National Center for Environmental Assessment/Superfund Health Risk Technical Support Center develops PPRTVs, at the request of EPA's Superfund program, for chemicals not found in IRIS.
- Tier 3- Other Toxicity Values – Tier 3 includes additional EPA and non-EPA sources of toxicity information. Priority should be given to those sources of information that are the most current, the basis for which is transparent and publicly available, and which have been peer-reviewed.

The currently recommended PRGs are also based on generic exposure assumptions and cancer risk levels used at Superfund, Federal Facilities, Brownfields, and RCRA sites. The 1 ppb (or 1,000 ppt) represents a lifetime excess cancer risk of  $2.5 \times 10^{-4}$  for residential soil, and 5 ppb (or 5,000 ppt) represents a lifetime excess cancer risk of  $1.4 \times 10^{-4}$  for commercial/industrial soil.

### **Why is EPA considering modifying the existing PRGs for dioxin in soil?**

While EPA finalizes its ongoing dioxin reassessment, EPA Administrator Jackson has asked that Agency staff consider the newest science to help evaluate the protectiveness of current PRGs for dioxin in soil.

### **How will the interim PRGs for dioxin in soil be used?**

Once the draft recommended interim PRGs are finalized, EPA will re-evaluate residual dioxin levels at CERCLA sites where dioxin contamination has previously been evaluated, particularly if environmental samples were previously analyzed using methods with a detection limit greater than the draft recommended interim PRGs. EPA will also work with states to plan the re-evaluation of RCRA sites. EPA will be taking public comment on the draft recommended interim PRGs until for 50 days, and anticipates issuing the final recommended interim PRGs in June of 2010.

1 U.S. Environmental Protection Agency. May 26, 2009. [EPA's Science Plan for Activities Related to Dioxins in the Environment](#). Press Release. .

2 U.S. Environmental Protection Agency. April 13, 1998. [Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites \(PDF\)](#). (6pp, 43K, [About PDF](#)) OSWER Directive 9200.4-26.

3 Toxicity equivalents consider the toxicity of the less toxic dioxin-like compounds as fractions of the toxicity of the most toxic compound (2,3,7,8-TCDD). Each compound is attributed a specific **“Toxic Equivalency Factor” (TEF)**. This factor indicates the degree of toxicity compared to 2,3,7,8-TCDD, which is given a reference value of 1.

4 40 CFR 300 Section 430(e)(2)(i)(A)(2)

5 Cancer risks normally are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a contaminant. This incremental or excess individual lifetime cancer risk is generally expressed as the probability (e.g.,  $1 \times 10^{-6}$  or one in a million) of an individual developing cancer.

6 A hazard quotient generally is the ratio of an exposure level for a single substance to a reference dose, which is an estimate of the daily exposure that is likely to be without an appreciable risk of deleterious effects during a lifetime.

7 EPA's *Risk Assessment Guidance for Superfund, Part B, Development of Preliminary Remediation Goals* 1991, EPA/540/R-92/003

8 U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. December 5, 2003. [Human Health Toxicity Values in Superfund Risk Assessments \(PDF\)](#). (4pp, 228K, [About PDF](#)) OSWER Directive 9285.7-53.

9 IRIS develops human health risk information for an EPA database that addresses potential human health effects that may result from long-term exposure to environmental contaminants. Dioxin toxicity values established based on the final dioxin reassessment will be incorporated into IRIS.

Source: <http://www.epa.gov/superfund/policy/remedy/sfremedy/remedies/dioxinsoil.html>