

US EPA ARCHIVE DOCUMENT



Superfund

Superfund Records Center

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EPA Non-Cancer Toxicity Value for Dioxin and CERCLA/RCRA Cleanups

On February 17, 2012, EPA released the final non-cancer dioxin reassessment, publishing a non-cancer toxicity value, or reference dose (RfD), for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in EPA's Integrated Risk Information System (IRIS). The RfD for TCDD is for immediate use at Superfund sites to ensure protection of human health.

The EPA's 2003 *Human Health Toxicity Values in Superfund Risk Assessments*, listed under "Supporting Documents" at this site, provides a hierarchy of three levels of toxicity values; IRIS toxicity values have been given a Tier 1 designation. In the absence of an IRIS value, EPA evaluates other sources of toxicity values. With the release of the Tier 1 IRIS RfD for TCDD, EPA no longer has a need for the interim preliminary remediation goals (PRGs) for dioxin in soil recommended in EPA's 2009 *Draft Recommended Interim Preliminary Remediation Goals for Dioxin in Soil at CERCLA and RCRA Sites* or the 1998 *"Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites."* As a result, these documents have been removed from this website.

The following are questions and answers providing information on the use of the RfD at RCRA and CERCLA sites.



SDMS DocID

509362

Questions and Answers

1. How will the new 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) Reference Dose (RfD) impact the cleanup of dioxin-contaminated sites?

In all cases, EPA's goal is protection of human health and the environment informed by the best available science as embodied in the RfD. In accordance with existing EPA guidance, the new RfD will be used to develop site-specific risk-based cleanup levels at CERCLA and RCRA sites. At sites that have been previously investigated or cleaned up under Superfund and RCRA, EPA Regions will consult with EPA Headquarters and will coordinate with our state partners to identify, prioritize and evaluate sites to determine if additional response action is needed.

2. Will additional cleanups be needed when the Agency releases the dioxin reassessment cancer results?

Dioxin-contaminated sites cleaned up based on the new non-cancer RfD are not expected to need additional cleanup when a new EPA cancer toxicity value for dioxin is published in EPA's Integrated Risk Information System (IRIS). This is because we anticipate that dioxin cleanup levels based on the new non-cancer RfD will be within the cancer risk range currently used by EPA's Superfund and RCRA cleanup programs.

3. What are the new screening soil dioxin preliminary remediation goals (PRGs), based on the new RfD and national, non-adjusted exposure factors?

Preliminary remediation goals (PRGs) are risk-based concentrations in media based on readily available information, which are used as a starting point in developing final remediation goals (NCP 40 CFR §300.430(e)(2)(ii)). With the release of the IRIS RfD for TCDD, the Agency no longer has a need for the PRGs for dioxin in soil recommended in EPA's 1998 *Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites* (EPA 1998) or the proposed interim PRGs provided in the December 30, 2009 *Draft Recommended Interim Preliminary Remediation Goals for Dioxin in Soil at CERCLA and RCRA Sites*.

Instead, consistent with the National Contingency Plan's (NCP's) preamble (see e.g., 55 Fed. Reg. 8666 at p. 8745 (March 8, 1990) and subsequent guidance (EPA 2003), the IRIS RfD is the preferred toxicity value to use as a starting point for establishing exposure screening levels that are protective of human health. Thus, this RfD is now the recommended value "to be considered" (TBC) for use in developing site-specific dioxin PRGs and cleanup levels under CERCLA and the NCP. For example, the PRG calculated using the new RfD of 0.7 pg/kg-day (picogram per kilogram-day) and EPA non-adjusted exposure factors would be 50 parts per trillion (ppt) toxicity equivalence (TEQ) for residential soil and 664 ppt TEQ for commercial/industrial soil. We expect the Regions often will have preferred site-specific data they can use to adjust these goals using site-specific exposure factors instead of the national exposure factors.

The site-specific dioxin PRGs themselves are not the final remediation goals. During the remedial investigation/feasibility study (RI/FS), PRGs are generally modified based on site-specific data (e.g., exposure duration, frequency of exposure, etc. - see *Risk Assessment Guidance for Superfund (RAGS) Part B*, see as well *The Role of Baseline Risk Assessments in Remedy Selection Decision*). Bioavailability is a factor to be considered during this process.

Superfund's nine remedy selection criteria (NCP 40 CFR §300.430(f)(5)(ii)) are subsequently applied to the site-specific risk-based PRGs to develop final remediation goals (see *A Guide to Preparing Superfund Proposed Plans, Records of Decisions, and Other Remedy Selection Documents*). The nine selection criteria are: protection of human health and the environment; compliance with ARARs; long-term effectiveness and permanence; toxicity, mobility or volume reduction through treatment; short-term effectiveness; implementability; cost effectiveness; state agency acceptance; and community acceptance.

4. To which environmental media does the new RfD apply?

The new oral RfD may be used to evaluate dioxin-contaminated environmental media, such as soil, dust, sediments, or fish tissue.

Additional information on evaluating dioxin at CERCLA and RCRA sites is found below.

Dioxin Tool Box

The Dioxin Tool Box is composed of several technical documents intended to assist Superfund Project Managers in the sampling and analysis of dioxin contaminated soils.

The Dioxin Tool Box includes:

- Technical information on using incremental composite sampling (ICS) to evaluate dioxin contaminated soil.
 - [User Guide - Uniform Federal Policy Quality Assurance Project Plan Template For Soils Assessment of Dioxin Sites \(PDF\)](#) (112pp, 5.9MB, [About PDF](#)) (September 2011)
- An ICS example quality assurance project plan in the format of the Unified Federal Policy.
 - [Template - Uniform Federal Policy Quality Assurance Project Plan For Soils Assessment of Dioxin Sites \(PDF\)](#) (99pp, 638KB, [About PDF](#))
- Fact sheets on the capabilities of Non Routine Analytical Services (NRAS) of the Technology Innovation and Field Services Division/ Office of Superfund Remediation

and Technology Innovation.

- o [PCB Congener Final NRAS Fact Sheet \(PDF\)](#) (3pp, 382KB, [About PDF](#))
- o [Dioxin-like materials NRAS Fact Sheet \(PDF\)](#) (4pp, 421KB, [About PDF](#))
- A fact sheet on management of dioxin contaminated soils.
 - o [Fact Sheet on the Management of Dioxin Contaminated Soils \(PDF\)](#) (28pp, 692KB, [About PDF](#))

Supporting Documents

- ["Bioavailability of Dioxins and Dioxin-Like Compounds in Soil" \(PDF\)](#) (83pp, 823K, [About PDF](#)) (January 2011) [Transmission Memo \(PDF\)](#) (2pp, 216K, [About PDF](#))
 - o The OSRTI Technical Report entitled "Bioavailability of Dioxins and Dioxin-Like Compounds in Soil" identifies and evaluates published literature relevant to estimating a relative bioavailability (RBA) value of dioxin and dioxin-like compounds in soil.
 - ["Bioavailability of Dioxins and Dioxin-Like Compounds in Soil, Peer Review Report." \(PDF\)](#) (140pp, 1635K, [About PDF](#))
 - o The OSRTI report entitled "Bioavailability of Dioxins and Dioxin-Like Compounds in Soil, Peer Review Report" presents the External Peer Review of the OSRTI Technical Report entitled "Bioavailability of Dioxins in Soil and Soil-Like Materials".
- ["State Soil Cleanup Levels for Dioxin" \(December 2009\)](#)
 - o Summarizes a review of state soil cleanup levels for dioxin and characterizes the science underlying the values.
- ["Review of International Soil Levels for Dioxin" \(PDF\)](#) (17pp, 109K, [About PDF](#)) (December 2009) [Appendix \(XLS\)](#) (8 worksheets, 144K)
 - o 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.
- ["Human Health Toxicity Values in Superfund Risk Assessments" \(PDF\)](#) (4pp, 229K, [About PDF](#)) (December 2003)
- ["The Role of Background in The CERCLA Cleanup Program" \(PDF\)](#) (13pp, 148K, [About PDF](#)) (April 2002)
 - o This document clarifies the U.S. EPA's preferred approach for the consideration of background constituent concentrations of hazardous substances, pollutants, and contaminants in certain steps of the remedy selection process, such as risk assessment and risk management, at CERCLA.

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Last updated on Wednesday, May 09, 2012