

Comments on
OSWER 9200.3-56

**DRAFT RECOMMENDED INTERIM PRELIMINARY REMEDIATION GOALS
FOR DIOXIN IN SOIL AT CERCLA AND RCRA SITES**

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I appreciate the opportunity to comment on the dioxin PRGs prepared by the EPA Superfund Office and released for public comment. I have participated in the Dioxin Reassessment since its inception in 1991 and look forward to the completion of that important effort. In addition, my consulting work involves analyzing contamination at Superfund and RCRA sites around the nation. I have had abundant opportunity to participate in and observe the application of PRGs in communities around the country. I draw on these experiences in reviewing the PRGs and preparing my comments. I respectfully submit the following items for consideration.

- 1- I recognize that the TEF approach is the best we have and I support its use wholeheartedly. The toxicology community recommends using TEFs used with internal dose, not so much with soil or other environmental media.
- 2- Air inhalation exposure is usually, but not always the least route. Case-by-case analysis needs to confirm this ratio and that the absolute value of the inhalation exposure is small for the target receptors/endpoints.
- 3- On page 6, the guidance understates the carcinogenicity of dioxin. The scientific community recognizes that dioxin causes cancer, IARC and NIEHS classified 2378 tcdd as carcinogen years ago. Dioxin, notably 2378 TCDD causes cancer.
- 4- Page 6-7. Again, the text understates the evidence on non-cancer effects. In experimental animals, low dose short term exposure causes reproductive and developmental harm. In humans, ample evidence indicates the exposures do not have to be as long as in cancer. See the work from the Dutch and from Seveso, Italy research efforts.
- 5- Pages 12-13 contain the critical information with the calculated PRGs for cancer and non-cancer effects. EPA determined that the cancer-based soil PRG is 3.7 ppt for a 1 in a million risk level and the non-cancer PRG is 72 ppt. The method for calculating these values is standard for Superfund or RCRA sites.

- 6- The Guidance should be clearer about the assumed proportion of the total dose that is due to the contaminated site soil for non-cancer health effects. The RSC explanation is satisfactory for regulators, but not for the public. There is another issue with the assumptions in the RSC explanation. In many cases, it is appropriate to assume that other, non-site sources contribute to the total body burden; in the case of dioxin, this assumption is well founded. The result to the quantitative PRG for dioxin would be to reduce the value according to the proportion of the total that is attributed to non-site sources. If non-site sources account for 90% of the 1 pg/kg/day, then only 0.1 pg/kg/day can be allowed from the site and the soil concentrations will thus have to be lower. This point is explained in the RSC text on pages 11-12. But the justification for using an RSC of 1 and not accounting for non-site dioxin source is not sufficient. EPA is likely correct that site-derived dioxin is greater than the 10% that would result from assuming the exposure patterns follow a strictly national average. The deviation from the national average is certainly not 100%, and some intermediate number needs to be selected, such as 25%, making the recommended PRG 18 ppt.
- 7- EPA goes on to provide an alternative PRG of the one in a million (1×10^{-6}) cancer risk value but does not use this lower number (3.7 ppt) as the first recommended alternative. The reasoning is that an EPA report (2007) presents data that soil levels in the US fall in the range of 0.2- 11.4 ppt, explaining this range as “natural background.” EPA makes several errors in this reasoning. First, these values are not “natural background” because the term properly applies to naturally occurring chemicals and elements. As an anthropogenic compound, dioxin has no “natural background,” acknowledging the occurrence of dioxin in geological formations in the southeast US. Second, the use of the term is also scientifically incorrect as used. The levels measured at 0.2 to 11.4 ppt are properly termed “ambient” to refer to the conditions found in the normal course of events without site specific influence. Finally, these ambient levels of dioxin in soil are clearly elevated as a result of human activities in the modern era (see the literature in the EPA dioxin reassessment exposure section on sources and environmental concentrations), and need to be reduced, not allowed to remain as the acceptable levels in soils.
- 8- EPA requests comment on the applicability of the PRGs. The lower values are far more appropriate, applicable and straightforward to implement. The 3.7 ppt and 17 ppt represent soil levels that protect human health at levels which are accepted and understood as protective for CERCLA and RCRA sites. The PRGs are applied to the cleanup of these contaminations in a site specific fashion. Thus, when applied at a site, the cleanup numbers are appropriately compared against ambient conditions, anthropogenic and natural background conditions. Contaminated site cleanup decisions must also take into account the future uses and future conditions. In such evaluations, EPA guidance already provides leeway in setting cleanup levels based on a cancer risk range from 10^{-4} to 10^{-6} . Starting with a

cancer risk range that is narrowed is inappropriate and can even be considered redundant to this existing latitude.

- 9- As EPA and peer reviewed documents have noted, dioxin releases and concentrations in environmental media have been declining. Such declines provide evidence that future soil dioxin levels will fall in the ambient environment. (The reason being that most ambient soil contains dioxin from atmospheric deposition that is declining. Ambient surface soil has the greatest opportunity for dioxin breakdown due to UV light in the presence of oxygen.) Thus, lower soil levels can and should be expected in the future.
- 10- To sum, there are two elements of the dioxin PRGs that need to be changed: the cancer risk needs to be based on one in a million (1×10^{-6}) risk and the non-cancer PRG needs to include non-site sources of dioxin, probably as 75% of the total. Both changes will result in lower PRGs to 3.7 ppt for cancer and 18 ppt for non-cancer.
- 11- EPA should not base this important policy decision on an error in defining and evaluating conditions in the ambient environment. As the proposed dioxin PRG guidance notes, the PRGs are used as a starting point in evaluating cleanup of contaminated sites, not the final decision. The proposed value of 72 ppt may be more appropriate as an upper bound guidance that EPA expects would never be exceeded when a site is isolated and has institutional controls. Communities around the country expect EPA to set cleanup standards and guidance that is protective of all human health and the environment. The proposed PRG for dioxin does not meet the standard that EPA describes and that the public expects.

Respectfully submitted,

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