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RE: Residential Cleanup Goals

The EPA Proposed Plan states the cleanup goals for chemicals of concern (COCs) for the Koppers Superfund Site are the Florida Soil Cleanup Target Levels (SCTLs), including the residential dioxin soil level of 7 ppt. for delineation and remediation of offsite residential soils.

There is apparent disagreement between EPA and FDEP regarding the ARAR that must be met for cleanups in Florida: that is, whether it is the cleanup numbers in 62-777 F.A.C. or only the 1E-6 risk level. Disappointingly it appears that EPA is in support of challenging the use of the Florida SCTL based on the following:

- **Proposed Plan.** Extensive discussion on the uncertainty of cleanup levels for dioxins and stating the Florida's SCTL is at the low end of the range.
- **Administrative Record.** EPA has rejected only portions of the risk assessment and has included numerous comments and includes letters that infer the Florida SCTL is conservative.
- **EPA Availability Session** (Oct 6, 2010). Discussions with risk assessors and emphasis on offsite dioxin data, and no other components of the remedy.

We recently received a document by Paul Anderson/Arcadis *Derivation of a Residential Site-Specific Soil Cleanup Target Level for Off-Site Soil at the Former Koppers Inc. Wood-Treating Facility in Gainesville, Florida* [SCTL Report] (October 2010). This report presents derivation of "refined, Site-specific, risk-based residential SCTLs for dioxins and furans". EPA had rejected those sections of previous risk assessments that used the MEE model that are used in this document. The approach is lacking in transparency, and the cumulative biases in the manipulation of the assumptions have implications that must be carefully considered. Many of the technical issues related to the use of probabilistic risk assessment and alternate exposure assumptions have been discussed in comments previously submitted by FDEP and the City of Gainesville, and only selected issues are raised in these comments.

Target Risk Level

In Florida, the target risk level upon which SCTLs for certain compounds are derived is established by law to be one in one million (1x10⁻⁶), which is less flexible than EPAs use of an acceptable risk range. However,

- Simply manipulating the underlying assumptions with no real information to justify changes to commonly used state or federal exposure assumptions is not justified.
- It is also a political decision to suggest that in Florida, the intent of the statute is to define a level that is protective of the "typical or average" Floridian – that is only half of the exposed population

must meet this level. There is guidance on risk management decisions when using probabilistic risk assessment that clearly constrain this assumption and the intent to use the RME.

The dioxin SCTL is not based overall on assumptions that differ significantly from those of USEPA.

Cleanup values are based on assumptions of chemical toxicity and level of exposure. For dioxin concentrations in residential soil associated with the 1×10^{-6} risk level,

- The value is 7 ppt. using Florida's default assumptions.
- The value is 3.7 ppt. defined based on recent EPA review of dioxin information.¹

Therefore, if the target risk level remains the same, the default assumptions used by EPA actually would lower the cleanup level. While EPA may have more flexibility in defining risk levels, they likely would not agree that all of their assumptions for defining residential PRGs are not correct.

There is really no site-specific information in the SCTL Report for derivation of 95 ppt. as the soil SCTL for residents near Koppers. Is the suggestion that these values are better and more accurate, and the EPA PRG should actually be 95 ppt? (and a reasonable 10^{-4} value would be 9500 ppt?) Does that USEPA's proposed interim PRG of 72 ppt. based on noncancer endpoints should be altered also based on similar adjustments to exposure assumptions? This is actually suggestion that standard assumptions should be altered on a national level.

The dioxin SCTL of 7 ppt. has been used as the cleanup level at other Florida Sites, therefore, there is precedent for this value. In the absence of substantial evidence of unique conditions at the Koppers site, the use of alternative values is arbitrary.

Sampling Depth

The determination of cleanup of a site is not simply selection of a number. It relates also to how the samples are collected and the value applied. For the Koppers site, the conceptual model is that contaminants have deposited in the residential neighborhood from air deposition. This means that chemicals like dioxins that have low water solubility will remain at the surface. It is also likely that areas of the yard that receive runoff from the roof and other structures may have "hot spots".

EPA guidance on soil screening values² emphasizes that it is critical to have a conceptual model to help determine how samples are collected and compared to screening values (or cleanup numbers). It emphasizes that if the contaminants are likely to be at the surface, as at this site, surface soils should be sampled and criteria compared for the surface layer (e.g. upper two centimeters of the ground surface). This is consistent with guidance from EPA Region 4 that defines "surface soil available for direct human contact as the top 12 inches. Surface soil samples should be collected from the most contaminated portion of the surface soil".³

¹ OSWER 9200.3-56 "Draft Recommended Interim Preliminary Remediation Goals For Dioxin In Soil At CERCLA And RCRA Sites" December 2009

² http://www.epa.gov/superfund/health/conmedia/soil/pdfs/ssg_main.pdf

³ <http://epa.gov/region04/waste/ots/healthbul.html>

Samples in the residential neighborhood were collected in a 0-6 inch interval, consistent with Florida's protocols. So while Florida may have a more stringent approach to the cleanup number, it is less conservative with respect to the sampling interval.

Currently, EPA has proposed a dioxin soil screening number based on noncancer effects of 72 ppt. If the upper 1-2 cm of soil at the site were sampled and compared to this value, the decision would not be so flexible.

Exposure Factors

There are residents in the neighborhood adjacent to the Koppers site that have been in this location for well over 30 years. Many of the residents have had gardens, raised chickens, and have other routes of exposure that are not explicitly included in the risk estimates. So in some cases, the default assumptions may underestimate exposure.

The following are comments on examples of the exposure factor changes in the SCTL Report that require more detailed scientific evaluation before accepting.

Relative Oral Bioavailability Factor (RBA). FDEP has consistently "rejected" modifying the RBA of 1 in the absence of site specific data. The EPA draft recommendations (Dec, 2009) included an RBA of 1, but would consider revisiting this when performing site specific assessments. There is only limited data on RBAs for dioxins in soil, and no site-specific data. Therefore, there is insufficient justification to arbitrarily support altering the RBA for the Koppers Site. It is not simply a discussion of the literature, but approaches to interpretation of small data sets, deriving a distribution from single number from the literature, and selecting a distribution that is biased toward low numbers. Again, these are subtle and not transparent issues that must be carefully considered before these changes are allowed.

Exposure Duration. The implications of the use of the MEE are totally not transparent. Standard assumptions for residential exposures are that persons reside in a home for 30 years, beginning as a child. The MEE model incorporates distributions of when a person may first move into the neighborhood and subsequently move from there or die. The median number of years is 15, and appears conservative because of some of the assumptions of exceeding residence times (88 years). However, these outliers likely do not impact the calculation significantly, and it is not just the number of years, but how many of these were as a young child, where the exposure is greater. The lack of transparency does not infer a more technically rigorous analysis.

Soil Ingestion Rates. Soil ingestion rate has been raised previously in the on-site risk assessment, referencing a study that (as confirmed by the lead scientist on the study) was not applicable for the Koppers Site worker. The SCTL Report recommends use of studies completed by University of Massachusetts scientists. The child soil ingestion rate is based on data collected over 1 week in September in Anaconda, Montana. The raw data used in several journal articles published over the past several years has not been available to EPA and other interested parties so that a more extensive peer review of those data can take place. Some scientists are uncertain about the analysis procedures used and have suggested opening this data set up for a thorough peer review. Again, there is insufficient information to over-ride the default values used by EPA and FDEP.

Other Factors. There are numerous changes from default assumptions that have incremental impact on altering the value. These include increasing the body weight, extending the average lifetime to 90 years, and assuming less of your body is exposed (one side of hands, forearms, and lower legs; not your head or other parts of your body that are frequently exposed in Florida). This is not based on any site specific information, and is totally arbitrary. In addition, inferences about how much time spent outdoors, etc. should be sensitive to other exposures to these contaminants. Soil brought indoors, present as house dust, may be as important as the direct ingestion of soil. *“Dust is largely composed of fine particles of tracked-in soil. The smaller dust particles cling to surfaces better than soil, and contaminant concentrations are often higher in house dust. Fine particles are likely to be more bioavailable, and degradation is slower indoors. Contaminants thus may be concentrated and more readily available in the areas most frequented.”* (Paustenbach et al. 1997)

Michigan Exposure Data. There is reference in the SCTL Report to the studies completed in Michigan. In EPA's Science in Action Fact⁴ sheet on the University of Michigan Dioxin Exposure Study (UMDES) study they state: *Overall, the University of Michigan Dioxin Exposure Study (UMDES) has produced a credible and valuable source of data on dioxin levels in adults in the Midland, Michigan area. However, there are limitations to the study that need to be understood. The UMDES does not appear to be relevant to EPA's risk management mission. For example, the study does not provide sufficient information to inform the development of preliminary remediation goals for soil, which are set using national default exposure and toxicity values and not site-specific data. In addition, for risk-based decision-making, EPA often focuses on highly exposed and/or sensitive subpopulations. The UMDES did not target such subpopulations. From a risk assessment perspective, this is a significant drawback*

Cancer Slope Factor. While there is considerable discussion of the conservativeness of the cancer slope factor of 150,000 (mg/kg/d)⁻¹ used by FDEP, and a range of lower values presented. However, EPA's current CSF is similar (130,000 (mg/kg/d)⁻¹), and certainly not the values inferred as more reasonable. EPA guidance discourages probabilistic approaches for dose response in human health assessment, and these other values in the SCTL Report have obviously not been accepted by EPA, so they remain vague inferences that an ever higher cleanup level is justified.

These comments are intended to only supplement my previously submitted comments and those by FDEP related to defensible assumptions for risk analysis and management decisions.

Sincerely,



Dr. Patricia V. Cline

Technical Advisor

⁴ <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=214244#Download>