Charge Questions for Proposed Approach for Developing Lead Dust Hazard Standards for Public and Commercial Buildings

Background

Section 402(c)(3) of TSCA directs EPA to revise the regulations promulgated under TSCA section 402(a), *i.e.*, the Lead-based Paint Activities Regulations, to apply to renovation or remodeling activities in target housing, public buildings constructed before 1978, and commercial buildings that create lead-based paint hazards. In April 2008, EPA issued the final Renovation, Repair and Painting Rule (RRP Rule) under the authority of section 402(c)(3) of TSCA to address lead-based paint hazards created by renovation, repair, and painting activities that disturb lead-based paint in target housing and child-occupied facilities (USEPA, 2008a). The term ‘‘target housing’’ is defined in TSCA section 401 as any housing constructed before 1978, except housing for the elderly or persons with disabilities (unless any child under age 6 resides or is expected to reside in such housing) or any 0- bedroom dwelling. Under the RRP Rule, a child-occupied facility is a building, or a portion of a building, constructed prior to 1978, visited regularly by the same child, under 6 years of age, on at least two different days within any week (Sunday through Saturday period), provided that each day’s visit lasts at least 3 hours and the combined weekly visits last at least 6 hours, and the combined annual visits last at least 60 hours. The RRP Rule establishes requirements for training renovators, other renovation workers, and dust sampling technicians; for certifying renovators, dust sampling technicians, and renovation firms; for accrediting providers of renovation and dust sampling technician training; for renovation work practices; and for recordkeeping. Interested States, Territories, and Indian Tribes may apply for and receive authorization to administer and enforce all of the elements of the RRP Rule.

Shortly after the RRP Rule was published, several petitions were filed challenging the rule. These petitions were consolidated in the Circuit Court of Appeals for the District of Columbia Circuit. On August 24, 2009, EPA entered into an agreement with the environmental and children’s health advocacy groups in settlement of their petitions (USEPA, 2009a). In this agreement, EPA committed to propose several changes to the RRP Rule. EPA also agreed to commence rulemaking to address renovations in public and commercial buildings, other than child-occupied facilities, to the extent those renovations create lead-based paint hazards. For these buildings, EPA agreed, at a minimum, to do the following:

- Issue a proposal to regulate renovations on the exteriors of public and commercial buildings other than child-occupied facilities by December 15, 2011 and to take final action on that proposal by July 15, 2013.
- Consult with EPA’s Science Advisory Board by September 30, 2011, on a methodology for evaluating the risk posed by renovations in the interiors of public and commercial buildings other than child-occupied facilities.
- Eighteen months after receipt of the Science Advisory Board’s report, either issue a proposal to regulate renovations on the interiors of public and commercial buildings other than child-occupied facilities or conclude that such renovations do not create lead-based paint hazards.

In order to evaluate the potential risks associated with lead exposure due to renovations in public and commercial buildings, and the potential need for regulations on these activities, it is first necessary to develop the hazard standards for lead dust on window sills and floors in public and commercial buildings; these become the standards to help inform the impact of renovation activities. These standards will identify dangerous levels of lead in paint and dust, and provide benchmarks on which to base remedial actions taken to safeguard children and the public from the dangers of lead. The document entitled “Proposed Approach for Developing Lead Dust Hazard Standards for Commercial and Public Buildings” describes the methods that EPA proposes to examine the hazard standards for floors and window sills in commercial and public buildings.

Charge Question 1. Draft Approach

OPPT has developed a draft Approach document for developing the hazard standards for floors and window sills in public and commercial buildings. This is intended to provide an overview of the approaches that will be used for the selection of the target blood lead levels, estimation of environmental media and exposure concentrations, and the blood lead modeling.

Question. Please comment on the reasonableness of the approach outlined in the draft Approach document.

Charge Question 2. Development of a Response Curve for the Blood Lead-Blood Pressure Relationship

The Approach document for public and commercial buildings discusses selecting blood lead concentrations associated with health effects in adults as well as children. This differs from the residential hazard standards because there may be some buildings in which children are unlikely to visit and OPPT may consider deriving an "adult standard" for certain public and commercial buildings. A large number of studies have found blood lead concentrations to be associated with varying degrees of blood pressure elevation in adults; OPPT will use this relationship as the hazard endpoint for adults.

The meta-analysis data provided in Nawrot et al (2002) were used to define the potential blood lead levels of concern. Levels of 0.3, 1, 5, 10, and 20 µg/dL were chosen based on the lower range of average blood lead levels represented in the studies included in the meta-analysis. These data, or a suitable subset of them, will be used to develop a response curve for the blood lead-blood pressure relationship that can be used in the hazard standard development for sills and floors.

Question. Please comment on this approach for developing a response curve for adults.

Charge Question 3. Conversion of Dust Loadings to Dust Concentrations

Section 3.3 and Appendix A of the Approach document describes the method for converting lead loadings to lead concentrations. Two methods are considered to convert from lead dust loading to lead dust concentration: a statistical regression model and a mechanistic mass-balance model. There are limited data available to develop an empirical relationship between lead dust loading and concentration for window sills and to parameterize the mechanistic model. In order to improve the approach, additional data would be needed or assumptions would have to be made which would introduce significant uncertainties to the results.

Question. Please comment on the proposed methods for converting dust loadings to dust concentrations. Please comment on whether the empirical or mechanistic model is preferred. Are there other methods that should be explored?

Charge Question 4. Relation of Sill Dust to Floor Dust

Section 3.2 of the Approach document identifies a relationship that will be assumed between floor dust lead loadings and window sill dust lead loadings. This is further elaborated in section 6.1.5. Some such relationship is needed because not all studies measure lead loadings in both locations and the models that take lead exposures into blood lead require unitary indoor dust inputs. After a fashion similar to the regression model for converting lead loadings to lead concentrations, an empirical model was developed relating floor and window sill dust loadings.

Question. Please comment on the proposed method to relate floor dust loadings to window sill dust loadings. Please comment on the discussion of the regression's development. Please comment on how the assumptions regarding compliance with hazard standards are incorporated. Are there other methods that should be explored?

Charge Question 5. Activity Patterns and Microenvironments

Section 3.4.1.2 of the Approach document describes how exposure profiles would be developed using data from the Consolidated Human Activity Database (CHAD) and algorithms from the Air Pollutants Exposure Model (APEX). Section 3.4.1.3 of the Approach document describes how the time spent by persons in various microenvironments would be used to define microenvironments of interest.

Question. Please comment on the proposed methods to establish the activity patterns and microenvironments for the blood lead modeling. Are there methods other than CHAD/APEX that should be explored?

Charge Question 6. **Blood Lead Modeling**

The assessment will estimate blood lead levels for children and adults. Section 4 of the document describes several models including the IEUBK model (EPA, 1994), the AALM model (EPA, 2005), the Leggett model (Leggett et al., 1993), the O'Flaherty model (O'Flaherty et al., 1993, 1995), and an empirical model (Lanphear et al., 1998b). For the purposes of developing the hazard standards for floor and window sills in public and commercial buildings, OPPT proposes to use the IEUBK model (EPA 1994) for children and the Leggett model (Leggett et al., 1993) for adults.

Question. Please comment on the use of the IEUBK and Leggett models. Please comment on whether other models should be used.