U.S. Environmental Protection Agency
EPA Science Advisory Board (SAB) Staff Office
Clean Air Scientific Advisory Committee (CASAC)
CASAC Panel for Review of EPA's Lead Renovation, Repair, and Painting (LRRP) Activities

Summary Minutes of Public Advisory Meeting

Monday, July 9, 2007 – 1:00 to 5:30 p.m. Eastern Time
Tuesday, July 10, 2007 – 8:30 a.m. to 4:00 p.m. Eastern Time

***Marriott at Research Triangle Park*, 4700 Guardian Drive, Durham, NC 27703**

Peer Review of EPA's: (1) Draft Lead Renovation, Repair, and Painting (LRRP) Activity IQ-Change Methodology; and (2) OPPT Dust Study

Panel Members: See CASAC Panel Roster – Appendix A

Agenda: See Meeting Agenda – Appendix B

Purpose: The purpose of this public meeting was for the CASAC Panel to conduct a peer review of the following two Agency documents: (1) EPA's *Draft Approach for Estimating Changes in Children's IQ from Lead Dust Generated During Renovation, Repair, and Painting in Residences and Child-Occupied Facilities* (Draft LRRP Activity IQ-Change Methodology, June 2007); and (2) EPA's *Draft Final Report on Characterization of Dust Lead Levels After Renovation, Repair, and Painting Activities* (OPPT Dust Study, January 2007)

Attendees:

Chair:	Dr. Rogene Henderson
CASAC Members:	Dr. Ellis Cowling Dr. James Crapo Dr. Douglas Crawford-Brown (via phone) Dr. Frank Speizer (via phone)
Panel Members:	Dr. Joshua Cohen Dr. Deborah Cory-Slechta (via phone) Dr. Richard Fenske (via phone) Dr. Bruce Fowler (via phone) Dr. Philip Goodrum Dr. Robert Goyer Mr. Sean Hays (via phone) Dr. Bruce Lanphear Dr. Frederick J. Miller Dr. Maria Morandi (via phone) Dr. Paul Mushak Dr. Ian von Lindern Dr. Barbara Zielinska

EPA SAB Staff:	Mr. Fred Butterfield, CASAC Designated Federal Officer (DFO) Dr. Vanessa Vu, SAB Staff Office Director Ms. Kyndall Barry, SAB Staff Office DFO (detailee)
Other EPA Staff:	Dr. Samuel Brown, OPPTS, OPPT Ms. Lynn Delpire, OPPTS, OPPT Ms. Cathy Fehrenbacher, OPPTS, OPPT Mr. Conrad Flessner, OPPTS, OPPT Dr. Elizabeth Margosches, OPPTS, OPPT Ms. Jackie Mosby, OPPTS, OPPT Dr. Andrea Pfahles-Hutchens, OPPTS, OPPT Dr. Jennifer Seed, OPPTS, OPPT Mr. Dennis Utterback, ORD, OSP Ms. Cindy Wheeler, OPPTS, OPPT

Convene Meeting, Call Attendance, Introduction and Administration

Mr. Fred Butterfield, Designated Federal Officer (DFO) for the CASAC, opened the meeting and the teleconference line, called attendance, and welcomed all attendees. He noted that the CASAC is a Federal Advisory Committee chartered under the Federal Advisory Committee Act (FACA) to provide advice and recommendations to the EPA Administrator. Consistent with FACA regulations, its deliberations are held as public meetings and teleconferences for which advance notice is given in the *Federal Register*. The DFO is present at all such meetings to assure compliance with FACA requirements. Mr. Butterfield explained that no transcript of this meeting's minutes will be taken, but a summary of the meeting will be posted on the SAB Web Site (http://www.epa.gov/sab) within 90 days after the meeting. All Panelists previously submitted documentation with respect to possible financial conflicts-of-interest or appearances of a lack of impartiality; this documentation was reviewed by the SAB staff prior to the teleconference meeting and found to be satisfactory.

Mr. Butterfield said that the purpose of the meeting was to review two draft documents: (1) the OPPT Dust Study and (2) the Draft LRRP Activity IQ-Change Methodology. He said there were no public commenters at this meeting so there would be additional time for Panel members' deliberations. The core of the committee is the existing CASAC Lead Review Panel, supplemented with four public health exposure experts and some ecological experts.

Dr. Vanessa Vu, SAB Staff Office Director, thanked Dr. Rogene Henderson, CASAC and Lead Review Panel Chair, the CASAC members, and supplemental Panelists for their participation in the meeting. The Agency highly values the scientific advice CASAC provides and this was reflected in their April 2007 letter to the EPA Administrator on the CASAC consultation on the first Draft LRRP Assessment. Dr. Vu emphasized that the two documents reviewed at this meeting will be used in direct support of the LRRP Rule that the Agency would be promulgating in 2008. She added that Dr. Maria Doa, OPPT, would be addressing the CASAC Lead Review Panel at this meeting by providing an overview of the LRRP Rulemaking Strategy. Dr. Vu thanked Dr. Doa, Dr. Jennifer Seed, Ms. Cathy Fehrenbacher, and the other OPPT staff for participating in this meeting.

Dr. Rogene Henderson echoed the earlier welcoming remarks and thanked all Panelists and OPPT participants. She said that this meeting represents an unusual task for CASAC in that the Lead Review Panel is responding to an OPPT request to review LRRP documents. Dr. Henderson asked Dr. Doa, OPPT, to explain the role CASAC is playing in the review of these LRRP documents.

Overview of the LRRP Rulemaking and the OPPT Dust Study

Dr. Maria Doa, Director, National Program Chemicals Division, OPPT, provided an overview of the LRRP rulemaking strategy and explained how the Dust Study and IQ-Change Methodology documents fit into this strategy. The EPA LRRP Program rulemaking is an important component of the Federal strategy to meet and maintain the Federal goal of eliminating lead poisoning in children. The rulemaking is intended to require training and work practices that will minimize exposure to lead paint hazards resulting from renovation activities. The two documents that OPPT is asking CASAC to peer review will be used in the rulemaking. The first OPPT document, "Characterization of Dust Lead Levels After Renovation, Repair, and Painting Activities" (OPPT Dust Study), will help shape the work practices in the final rule and will provide input to the second OPPT document, "An Approach for Estimating Changes in Children's IQ from Lead Dust Generated During Renovation, Repair, and Painting in Residences and Child-Occupied Facilities" (Draft LRRP Activity IQ-Change Methodology, or the Approach). Dr. Doa explained that the Approach will be an important factor in determining the benefits of the rulemaking, as well as meeting and maintaining the Federal goal to eliminate lead poisoning in the U.S. by 2010.

Dr. Doa outlined the statutory framework for the rule, stating that Title X of the 1992 Residential Lead-Based Paint Hazard Reduction Act is a roadmap for the Federal response to lead poisoning. It assigns responsibility for actions to various Federal agencies, directing EPA to develop regulations to address abatement and renovation activities. In addition to Title X, the Presidential Task Force on Environmental Health Risk established a Federal goal to eliminate lead poisoning in the United States by 2010. EPA's strategy to achieve the 2010 goal is a multifaceted approach intended to eliminate childhood lead poisoning. EPA efforts include: developing hazard standards; developing a trained workforce and work practice standards for abatement and renovation; establishing real estate disclosure; developing pre-renovation education programs; and targeting efforts to reach at-risk children.

EPA has a statutory mandate to engage in lead abatement and to improve the safety of LRRP activities. Regarding abatement, a final rule was published on August 29, 1996. It included requirements to: certify contractors, accredit training providers, develop work practice standards, and allow state program authorization. With respect to LRRP activities, in September 1997, EPA released guidelines for the conduct of renovation, and in January 2000 released a report on hazards from renovation tasks. EPA now is proposing to revise the abatement regulations to apply to renovation activities that create lead hazards.

The Toxic Substances Control Act (TSCA), Section 402(c) (3), directs EPA to revise the lead-based paint activities regulations to apply to renovation activities that create lead-based paint hazards. The lead-based paint hazards have two parts: (1) a dust lead hazard, which is defined as surface dust containing a mass-per-area concentration of lead equal to or in excess of 40 $\mu g/ft^2$

on floors or 250 $\mu g/ft^2$ on interior window sills; and (2) a soil lead hazard, which is defined as bare soil containing total lead equal to or exceeding 400 parts per million (ppm) in a play area or an average of 1,200 ppm in the rest of the yard. In the LRRP Program proposal, EPA determined that RRP activities can reasonably be anticipated to create lead-based paint hazards. This determination obligates EPA to revise the lead-based paint activities regulations to apply to RRP activities that disturb lead-based paint.

On January 10, 2006, EPA released its proposed requirements for training and lead-safe work practices for RRP activities. These requirements apply to pre-1978 rental housing and pre-1978 owner-occupied housing where a child under 6 years old resides. On June 5, 2007, these applicability requirements were extended to pre-1978 child-occupied facilities (COFs), wherein children spend at least 50 percent of their time. A primary consideration in developing the regulations is the extent to which the lead-based paint hazards resulting from renovation and remodeling activities are eliminated. This determination is different from other TSCA rulemakings in which a "no unreasonable risk" determination must be made. The Dust Study will be the primary factor considered in determining whether the proposed work practices should be modified. As with other rulemakings that are determined to be "significant regulatory action(s)" under Executive Order 12866 (Regulatory Planning and Review), EPA is required to conduct an economic analysis of the costs and benefits associated with the rulemaking. The primary purpose of the Approach document is to support the benefits assessment in the economic analysis.

Ms. Jacqueline Mosby, OPPT, provided an overview of the Dust Study. She explained that, shortly after the LRRP rule was proposed, EPA began planning a field study to collect data for the risk approach and economic analysis for the final rule. The study was undertaken to collect comparative data on lead levels likely to result from work practices under the proposed rule versus lead levels likely to result from baseline practices that would continue to be used in the absence of the final LRRP rule. The study design was peer reviewed prior to the commencement of field work. The field work was initiated in October 2006 and the final report was completed in January 2007. The draft Dust Study that the CASAC Panel is reviewing also was released to the public for comment. The 30-day public comment period on the draft Dust Study closed in mid-April 2007.

In the Dust Study, the major work practices under the proposed rule that were employed for interior jobs included: the use of containment plastic sheeting on floors and as an airlock in doorways in the work area; specialized cleaning with a HEPA vacuum and by wet mopping; and cleaning verification with disposable cleaning cloths. Interior baseline practices included: no use of plastic sheeting, cleaning by broom sweeping and a shop vacuum, and no verification of cleaning. For exterior jobs, the major proposed rule work practice was the use of plastic sheeting as a ground cover. This plastic sheeting ("rule plastic") was laid out to catch the debris and dust from the renovation job. Additional plastic sheeting was laid under the rule plastic and extended outward as a protective measure. Trays also were placed just outside the rule plastic to assess how far the dust was spreading.

The Dust Study renovation jobs were carried out at 15 vacant housing units in the Pittsburgh, Pennsylvania and Columbus, Ohio, areas and a vacant school in Columbus, Ohio, that represented a COF. Sixty interior experiments and 15 exterior experiments were conducted, with a total of 5,059 environmental samples collected. There are six objectives, or questions, in the

Dust Study. Some of these questions are: What is the effect of low-, medium-, and high-level RRP work dust lead levels (interior and exterior)? Do different levels of RRP work, the use or nonuse of plastic, or the use or nonuse of proposed rule cleaning methods result in differences in the amount of lead dust migration from the work room to adjacent rooms?

The overall results from the study supported the practices outlined in the proposed rule. For interior renovation jobs, the application of practices described in the proposed rule did result in lead levels for work room floors and sills at the end of the job that were lower than those achieved using baseline practices (e.g., no plastic sheeting and cleaning with a shop vacuum). Likewise, for all exterior renovation jobs, there was a substantial difference between the total amount of dust lead captured by the "rule plastic" and the amount under the "rule plastic." For some exterior jobs, substantial amounts of lead also were measured just beyond the rule plastic.

Summary of the CASAC Lead Review Panel Comments on the OPPT Dust Study Report

Issue 1. Study Objectives

Panel members generally believed that the study objectives were addressed and analyzed. However, because of the large amount of data and the detailed analyses presented in the report, members found that:

- The existing lead-based paint hazards of 40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on interior window sills are out of date and not protective of children from lead hazards.

- The "white glove" verification process is nonscientific and produces questionable results. One member stated, "This is a foolhardy attempt to minimize the costs of LRRP."

- It would be helpful if the six study objectives were stated with simple aims rather than multiple questions. Members suggested that the report clarify whether Objective "X" is a seventh objective.

- The statistical treatment of data within each of the objectives is uneven: in some cases, for example, Figure 6-3, the geometric means are presented but the geometric standard deviations are omitted; in other cases, for example, Table C2.7a, a statistical test of geometric mean differences is not presented.

Issue 2. Study Conclusions

Panel members generally agreed with the study conclusions that the proposed rule practices did result in overall post-job lead levels lower than the baseline conditions. However, some members expressed the following concerns about the report:

- The summary sections (page 2-1) are short and should be expanded to provide findings that address each of the study objectives listed on pages 1-2 and 1-3, followed by a paragraph presenting limitations and caveats.

- The report should not dismiss post-job or post-cleaning lead values that do not achieve the EPA proposed guideline.

- Data must be presented in a more reader-friendly format; for example, Tables 9-1 and 9-2 provide no results of statistical analyses.

- The conditions supporting the conclusion that the proposed rule's procedures led to lower post-renovation dust lead loading values need to be more fully described.

Issue 3. Range of Data

Although the study protocol is well defined in the report, many Panel members commented that the tables, graphs, figures, and other information do not properly convey the range of data in the study. In addition, the tables and graphs are overwhelming and/or overly complex. Some specific Panel member comments included:

- The graphs present mean values, but do not include variability (e.g., standard deviations, geometric standard deviations [GSDs], or 95 percent confidence intervals). Information should be presented in summary tables (in Chapter 6 or an appendix), including the geometric mean and measures of variability.

- The titles and footnotes in the tables and graphs do not fully or accurately describe what is being presented. It would have been easier to understand if the report focused on the primary analyses and results, shifting the extensive data to the appendices.

- Many of the graphs are log-based and the differences between the baseline and experimental conditions are described in terms of p-values alone. For the lay reader, it would be more informative to describe the magnitude of these changes in addition to p values.

- The presentation of data in many tables is confusing; for example, Table 9-1, does not explain why post-job lead levels are not expressed as whole numbers.

Issue 4. Report Organization and Clarity

Panel members had mixed views about the report's organization and clarity. Some members found the layout of the report to be logical and consistent but indicated that it is not an "easy read" because of the large amount of data and analyses. Other members suggested that the report is not logically laid out, consistent or easy to follow and further commented that the study is complex and uneven in its treatment of some data and conclusions. Some specific member comments included:

- It would be helpful to know the extent to which the specific sites analyzed are representative of the range of situations found across the nation.

- Some issues, such as worker blood lead monitoring and owner-occupied versus vacant housing units during RRP jobs, should be discussed in the report.

- The report's table of contents should be proofread; for example, in Section 9 there are section headings that do not match the table of contents.

Issue 5. Data Collection and Descriptive Analysis

Some Panel members found the data collection and descriptive analysis to be the strengths of report. They suggested that the description of the field conditions and deviations from the original protocols (Chapter 3), the field experiments (Chapter 4), and the overall descriptive analysis for the interior and exterior jobs represented a significant analytic effort on EPA's part. Other members, however, had questions about data that were not provided in the report. Members' comments about these various issues included:

- The report does not address the difference between lead loading and dust loading. Data on interior building dust loading in addition to dust lead loading should have been provided.

- The movement of dust particles from the exterior to the interior of the building during RRP activities should have been provided.

- Timelines of sampling activities should be provided relative to the stages of the various experiments.

- All tables and graphs should include units; some graphs in the appendices do not have x- or y-axis titles.

- Measures of variability, such as error bars or confidence intervals, are missing from many of the figures.

Issue 6. Statistical Modeling Results

Whereas several Panel members found that the statistical methods were appropriately described, others were less certain about the assumptions used for the choice of models and statistical analyses. Some member comments about these issues included:

- Given the variability of the post-RRP data, modeling based on geometric measures of central tendency may not be the best way to evaluate the data based on adoption of the proposed rules.

- The results of the statistical modeling should be presented more simply and should include various increments of baseline cleaning (e.g., $< 10\ \mu g/ft^2$, $< 20\ \mu g/ft^2$, etc.) rather than only achieving floor dust lead loading values of $40\ \mu g/ft^2$ and sill dust lead loading values of $250\ \mu g/ft^2$.

- The coefficients of determination (R^2) derived from regressions are strongly influenced by including non-detected values. Panel members recommended excluding non-detected

values or conducting a separate analysis on detects only, especially for regressions that involve comparisons to clearance levels (e.g., Figures C3.2a–C.3.2c).

Overview Presentation on the Draft OPPT Document "An Approach for Estimating Changes in Children's IQ from Lead Dust Generated During Renovation, Repair, and Painting in Residences and Child-Occupied Facilities" (the Approach)

Dr. Jennifer Seed, OPPT, provided an overview of OPPT's document "An Approach for Estimating Changes in Children's IQ from Lead Dust Generated during Renovation, Repair, and Painting in Residences and Child-Occupied Facilities" (the Approach). Dr. Seed said that the scope of OPPT's analysis has evolved since its February 2007 consultation with CASAC. The purpose of the Approach document is to provide the methodology that will be used to estimate IQ change in children less than six years of age associated with lead exposure from RRP activities in residences and COFs for the benefits section of the economic analysis that will be prepared by EPA.

Using the methods presented in the Approach document, thousands of houses and COFs with different combinations of RRP activities will need to be "built" for the economic analysis. In this document, estimates of dust lead loadings are made for two examples: (1) a house with a single RRP activity — a window replacement; and (2) a house with eight RRP activities — kitchen renovation, bathroom renovation, 10 door or window replacements, interior painting, HVAC work, electrical wiring work, plumbing work, and installation of a security system. Estimates are made for each example with and without the requirements of the LRRP proposed rule. The dust lead loadings are then converted to dust lead concentrations. For each of the two examples, a distribution of blood lead levels is estimated for children under age six. Finally, the distribution of a child's IQ change due to the resultant lead exposure is characterized for each of the two examples. Dr. Seed clarified that the examples used in this document are only two examples of a variety of activity combinations. This document is *not* intended to assess risks associated with lead exposure from RRP activities or efficacy of the proposed control options; it is simply intended to describe the methods to be used to build the economic analysis. She outlined the general steps used in the document to estimate changes in neurocognitive functions in children from lead exposure due to RRP activities. These steps were outlined using a flow chart:

Estimate dust lead generated from specific renovation activity (activities)
↓
Convert dust lead loadings to dust lead concentrations
↓
Estimate blood lead (using biokinetic models)
↓
Estimate IQ change

Dr. Seed noted that the exposure data used in the Approach document are drawn from the OPPT Dust Study. The Approach document uses data from the OPPT Dust Study to estimate the comparative lead exposure impact of each type of RRP activity. For each activity, the relevant exposure media are identified — indoor dust and indoor air for inside activities and outdoor soil for outside activities. In the Approach document, exposures to the five media — air (ambient

and indoor), indoor dust, outdoor soil, diet, and drinking water—are considered. Exposures to drinking water and diet are assumed to be unaffected by RRP activities and are characterized using reasonable, national-scale default values.

In the Approach document, two biokinetic models were used to estimate blood lead levels in children. These include the Integrated Exposure Uptake Biokinetic (IEUBK) model for Children and the International Commission for Radiation Protection Model (the Leggett model). Both models are well documented, widely used, and have been subject to a range of testing and calibration exercises.

Once the blood lead levels are estimated from the media concentrations, these values are converted to IQ changes using regression equations developed by Lanphear *et al.* (2005). Lanphear *et al.*-derived regression relationships between blood lead metrics and IQ test results using various linear equations. The log-linear and piecewise linear regression models were selected because they provided the strongest relationships for the data.

Dr. Seed concluded her presentation with an outline of the eight charge questions OPPT prepared for the CASAC Lead Review Panel to address. The final LRRP rule is scheduled to be released in February 2008. To reach this deadline, the EPA cost-benefit analysis must be completed in October 2007, after which the rulemaking proposal package will be submitted to the Office of Management and Budget for review in November 2007.

Summary of the CASAC Lead Review Panel Comments on the OPPT Approach Document

Issue 1. Overall Approach and Utility

Many Panel members had reservations about the usefulness of the Approach document in its current form given the limitations of the data in the OPPT Dust Study report. Further, they found that building all of the houses and COFs required for the economic analysis would compound the problem because of the small and limited original dataset. Member comments about these issues included:

- Much of the data in the Dust Study are concentration-driven, not loading-driven.
- Worst case scenarios should have been analyzed, rather than a few variations of extreme renovations.
- Despite a great deal of uncertainty about the methodology and datasets, the emphasis should be on how to improve the Approach methods and make better use of them.

Issue 2. Sensitivity and Monte Carlo Analysis

Most Panel members felt that the document included a lot of data and applauded OPPT for its efforts to address a difficult analytical problem. Nonetheless, several members raised questions about how the data were assessed and used to reach the intended outcomes in the document. Specifically, member comments included:

- The concepts of uncertainty and variability should be separated. Further, the sensitivity analyses need to focus on whether a variable or factor imparting uncertainty makes a difference in the outcome.

- It is not clear that the sensitivity analyses and Monte Carlo analyses address the most important sources of uncertainty.

- A fuller discussion is needed to examine why all input variables were only allowed to vary by 10 percent with the resulting elasticity and sensitivity statistics then being computed.

- The assumption that the estimated mean blood lead values are accompanied by a geometric standard deviation of 1.2 for the IEUBK and Leggett Models is questionable.

Issue 3. Blood Lead Modeling

Panel member comments about the biokinetic models were mixed. Several members recommended not using the IEUBK Model for blood lead level estimates. They argued that, for the types of analysis needed in support of the proposed rule, the Leggett Model results are far more relevant than the IEUBK Model results. A few members, however, supported the use of the IEUBK Model because it provides for steady state exposures and, if both models were used, it would provide a means to bound the data. In general, members believed that the proposed models may be underestimating IQ impacts. Some member comments about these issues were:

- The IEUBK Model could be used if time series data (Exhibits 5-10 and 5-11) are used for uptakes.

- The Leggett Model is the only model of the two that is valid for predicting the change in blood lead levels associated with short-term, acute exposures.

- The O'Flaherty Model could be used in conjunction with the Leggett Model; this would help to make modeling uncertainty transparent.

- To avoid the high Leggett Model predictions, empirical data from the National Health and Nutrition Examination Survey could be used as background and a biokinetic model increment could then be added.

- Currently sensitive subpopulations (i.e., those who react in a more sensitive manner to a given blood lead value) should be included in the models.

- For any modeling, it is important to rely on incremental increases in blood lead levels and IQ rather than on absolute blood lead level or IQ.

Issue 4. Estimate of IQ Change

Members positively responded to the question about whether the limitations and strategies associated with the models were addressed. They found that the log-linear model, when coupled

with a 1 µg/dL cutoff, makes the most sense because it fits the data from the meta-analysis better and should be a more accurate predictor of IQ change. Given that the piecewise linear model may underestimate effects, there was general agreement that the log-linear model would be best used for the economic analyses. Some members also noted that the selection of a blood lead level model should determine what IQ change model is used because the results will differ. The piecewise regression model may be most useful for population exposure levels when children's exposures are below 7.5 µg/dL.

Issue 5. Adaptation of Approach for COFs

Only a small dataset for COFs was available from the OPPT Dust Study and members did not have many specific comments about COFs versus housing unit data. Most of the Panel members' comments dealt with the Approach methodology (e.g., converting dust lead loadings to dust lead concentrations, estimating blood lead levels, and estimating IQ change) and the general conclusion was that their comments on these methods applied equally to houses and COFs.

Issue 6. Adaptation of Approach Using Age of Housing

Most Panel members agreed that the age of housing does have an impact on lead level exposures. Unless some quantification of house vintage is used, members felt that there would be an overestimate of the risk reduction benefits (e.g., the cost/benefit ratio) for more recently built houses (e.g., 1950–1978 and post-1978 houses). One member questioned how a correct age could be assigned to a house in light of remodeling changes. Is the age of the house based on the age of the original foundation or the most recent renovation? To address this issue, another member suggested using a spreadsheet to stratify the time at which a house was built across the three relevant time periods — pre-1950, 1950 to 1978, and post-1978 — and assign the estimated level of lead paint content for each time period. Adding the time of renovation and a constant value for the time between paint layers to these data would allow for a closer approximation of the average lead paint content for a time period and the relative lead exposure levels.

Issue 7. Adaptation of Approach for Exterior Renovation, Repair, and Painting

In general, Panel members found that the exterior RRP protocol, in the context of the proposed rule, was simpler and more straightforward than the interior RRP protocol. For exterior renovations, they agreed that using plastic sheeting as a ground cover and vertical work containment would be cost effective and a simple way to reduce and contain lead contamination. One member noted that much of the exterior lead contamination from renovation is within the vicinity of the roof drip line; most children do not have a play area that close to a house, lowering the possibility that children will be exposed to lead contamination outdoors.

Issue 8. Adaptation of Approach for Other Considerations

Panel members generally agreed that the approach outlined in the document was well written and might be adapted to other exposure scenarios and housing and COF configurations; however the application(s) would be limited. It was Panel members' understanding that the goal of the document was not to review the efficacy of the proposed LRRP rule but to develop a

methodology that would allow for the building of multiple exposure scenarios, and in this regard several members had comments. Some specific member comments included:

- The small database from the Dust Study limits the value of the model input data.
- A major limitation of the Approach is that it does not account for the activity patterns in a building, an adjacent yard, or both (e.g., whether individuals are resting, exercising, or engaging in other activities).
- EPA maintains a database, the Consolidated Human Activity Database, that can be helpful in describing activity patterns and even air concentrations in houses.
- Blood lead modeling applications would have to be changed to allow for broader use of the methodology.
- Predictive changes in children's IQs across a time series would be needed to make the methodology more applicable.

Summary and Next Steps

Dr. Henderson asked the CASAC Lead Review Panel member leads for each of the eight OPPT charge questions for the Approach document to submit to her by July 23, 2007, a draft summary of the Panel members' responses to these charge questions. These summaries will be integrated into a CASAC Lead Review Panel letter to the EPA Administrator on the results of the Panel's peer review of the OPPT documents. Depending on how well the summaries can be integrated, a public CASAC Lead Review Panel teleconference may be scheduled in early August 2007 to review the draft letter inputs. If a teleconference is scheduled, the time and date of the teleconference will be posted on the SAB Web Site ahead of time to allow all interested parties to participate.

In conclusion, Dr. Henderson and Mr. Butterfield thanked the EPA staff and CASAC Panel members for their efforts in the 2-day meeting. Mr. Butterfield adjourned the meeting at 4:15 p.m. on July 10, 2007.

Respectfully Submitted:

/s/

Fred A. Butterfield, III

Fred A. Butterfield, III
CASAC DFO

Certified as True:

/s/

Rogene Henderson, Ph.D.

Rogene Henderson, Ph.D.
CASAC Chair

Date: September 13, 2007

Appendix A – Roster of the CASAC Panel for Review of EPA's LRRP Activities

U.S. Environmental Protection Agency
Science Advisory Board (SAB) Staff Office
Clean Air Scientific Advisory Committee (CASAC)
CASAC Panel for Review of EPA's Lead Renovation, Repair, and Painting (LRRP) Activities

CHAIR

Dr. Rogene Henderson*, Scientist Emeritus, Lovelace Respiratory Research Institute, Albuquerque, NM

MEMBERS

Dr. Joshua Cohen**, Research Associate Professor of Medicine, Tufts University School of Medicine, Institute for Clinical Research and Health Policy Studies, Center for the Evaluation of Value and Risk, Tufts New England Medical Center, Boston, MA

Dr. Deborah Cory-Slechta**, Director, University of Medicine and Dentistry of New Jersey and Rutgers State University, Piscataway, NJ

Dr. Ellis Cowling*, University Distinguished Professor-at-Large, North Carolina State University, Colleges of Natural Resources and Agriculture and Life Sciences, North Carolina State University, Raleigh, NC

Dr. James D. Crapo [M.D.]*, Professor, Department of Medicine, National Jewish Medical and Research Center, Denver, CO

Dr. Douglas Crawford-Brown*, Director, Carolina Environmental Program; Professor, Environmental Sciences and Engineering; and Professor, Public Policy, Department of Environmental Sciences and Engineering, University of North Carolina at Chapel Hill, Chapel Hill, NC

Dr. Richard Fenske†, Professor, Department of Environmental and Occupational Health Sciences, School of Public Health and Community Medicine, University of Washington, Seattle, WA

Dr. Bruce Fowler**, Assistant Director for Science, Division of Toxicology and Environmental Medicine, Office of the Director, Agency for Toxic Substances and Disease Registry, U.S. Centers for Disease Control and Prevention (ATSDR/CDC), Chamblee, GA

Dr. Philip Goodrum†, Senior Scientist I/Manager, ARCADIS BBL, ARCADIS of New York, Inc., Syracuse, NY

Dr. Robert Goyer [M.D.]**, Emeritus Professor of Pathology, Faculty of Medicine, University of Western Ontario (Canada), Chapel Hill, NC

Mr. Sean Hays**, President, Summit Toxicology, Allenspark, CO

Dr. Bruce Lanphear [M.D.]**, Sloan Professor of Children's Environmental Health, and the Director of the Cincinnati Children's Environmental Health Center at Cincinnati Children's Hospital Medical Center and the University of Cincinnati, Cincinnati, OH

Dr. Frederick J. Miller**, Consultant, Cary, NC

Dr. Maria Morandi†, Assistant Professor of Environmental Science & Occupational Health, Department of Environmental Sciences, School of Public Health, University of Texas – Houston Health Science Center, Houston, TX

Dr. Paul Mushak**, Principal, PB Associates, and Visiting Professor, Albert Einstein College of Medicine (New York, NY), Durham, NC

Mr. Richard L. Poirot*, Environmental Analyst, Air Pollution Control Division, Department of Environmental Conservation, Vermont Agency of Natural Resources, Waterbury, VT

Dr. Michael Rabinowitz**, Geochemist, Marine Biological Laboratory, Woods Hole, MA

Dr. Armistead (Ted) Russell*, Georgia Power Distinguished Professor of Environmental Engineering, Environmental Engineering Group, School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA

Dr. Joel Schwartz**, Professor, Environmental Health, Harvard University School of Public Health, Boston, MA

Dr. Frank Speizer [M.D.]*, Edward Kass Professor of Medicine, Channing Laboratory, Harvard Medical School, Boston, MA

Dr. Ian von Lindern**, Senior Scientist, TerraGraphics Environmental Engineering, Inc., Moscow, ID

Dr. Barbara Zielinska**, Research Professor, Division of Atmospheric Science, Desert Research Institute, Reno, NV

SCIENCE ADVISORY BOARD STAFF

Mr. Fred Butterfield, CASAC Designated Federal Officer, 1200 Pennsylvania Avenue, N.W., Washington, DC, 20460, Phone: 202-343-9994, Fax: 202-233-0643 (butterfield.fred@epa.gov)

* Members of the statutory Clean Air Scientific Advisory Committee (CASAC) appointed by the EPA Administrator

** Members of the CASAC Lead Review Panel

† Members of the Science Advisory Board (SAB) or SAB panel

Appendix B – Meeting Agenda

U.S. Environmental Protection Agency
EPA Science Advisory Board (SAB) Staff Office
Clean Air Scientific Advisory Committee (CASAC)
CASAC Panel for Review of EPA's Lead Renovation, Repair, and Painting (LRRP) Activities

Public Advisory Meeting

Monday, July 9, 2007 – 1:00 to 5:30 p.m. Eastern Time
Tuesday, July 10, 2007 – 8:30 a.m. to 4:00 p.m. Eastern Time

***Marriott at Research Triangle Park*, 4700 Guardian Drive, Durham, NC 27703**

Peer Review of EPA's: (1) Draft Lead Renovation, Repair, and Painting (LRRP) Activity IQ-Change Methodology; and (2) OPPT Dust Study

Meeting Agenda

Monday, July 9, 2007

1:00 p.m.	**Convene Meeting; Call Attendance; Introductions and Administration; and Overview of Meeting Agenda**	Mr. Fred Butterfield, CASAC Designated Federal Officer (DFO)
1:10 p.m.	**Welcome & Opening Remarks from EPA Science Advisory Board (SAB) Staff Office**	Dr. Vanessa Vu, Staff Director
1:15 p.m.	**Purpose of Meeting**	Dr. Rogene Henderson, Chair
1:20 p.m.	**Welcome; and Lead Renovation, Repair, and Painting (LRRP) Strategy Overview from EPA's Office of Pollution Prevention and Toxics (OPPT)**	Dr. Maria Doa, Director, National Program Chemicals Division, OPPT
	Overview Presentation on OPPT Dust Study	Ms. Jacqueline Mosby, OPPT
1:45 p.m.	**Formal Public Comment Period**	Mr. Butterfield (Facilitator)
2:00 p.m.	**CASAC Panel Discussion on OPPT Dust Study in Response to Charge Questions**	Dr. Henderson, Panel Members (Drs. Maria Morandi, Richard Fenske, Phil Goodrum & Randy Maddalena)
3:00 p.m.	**Break***	
3:15 p.m.	**CASAC Panel Discussion on OPPT Dust Study (continued)**	Dr. Henderson, Panel Members (Drs. Douglas Crawford-Brown, Bruce Lanphear & Michael Rabinowitz)

Notes:
* Periodic breaks will be taken as necessary and at the call of the Chair.

Monday, July 9, 2007 (continued)

4:15 p.m.	**Overview Presentation on Draft LRRP Activity IQ-Change Methodology**	Ms. Cathy Fehrenbacher, OPPT Dr. Jennifer Seed, OPPT
4:40 p.m.	**CASAC Panel Discussion on Draft LRRP Activity IQ-Change Methodology, Charge Question 2:** ***Sensitivity of Monte Carlo Analysis***	Dr. Henderson, Panel Members (Drs. Fred Miller & Josh Cohen)
5:25 p.m.	**Summary, Wrap-Up and Next Steps**	Dr. Henderson
5:30 p.m.	**Adjourn Meeting for the Day**	Mr. Butterfield

Tuesday, July 10, 2007

8:30 a.m.	**Reconvene Meeting; Call Attendance**	Mr. Butterfield
8:35 a.m.	**Re-cap of Previous Day's Meeting**	Dr. Henderson
8:40 a.m.	**Public Comment Period***	Mr. Butterfield (Facilitator)
8:45 a.m.	**Additional OPPT Comments**	Dr. Seed, Ms. Fehrenbacher
8:50 a.m.	**CASAC Panel Discussion on Draft LRRP Activity IQ-Change Methodology, Charge Question 1:** ***Overall Approach and Utility***	Dr. Henderson, Panel Members (Drs. James Crapo & Ellis Cowling)
9:20 a.m.	**CASAC Panel Discussion on Draft LRRP Activity IQ-Change Methodology, Charge Question 3:** ***Blood Lead Modeling***	Dr. Henderson, Panel Members (Drs. Bruce Lanphear, Joshua Cohen & Bruce Fowler)
10:15 a.m.	**Break****	
10:30 a.m.	**CASAC Panel Discussion on Draft LRRP Activity IQ-Change Methodology, Charge Question 3:** ***Blood Lead Modeling*** **(continued)**	Dr. Henderson, Panel Members (Drs. Bruce Lanphear, Joshua Cohen & Bruce Fowler)
10:45 a.m.	**CASAC Panel Discussion on Draft LRRP Activity IQ-Change Methodology, Charge Question 4:** ***Estimate of IQ Change***	Dr. Henderson, Panel Members (Drs. Deborah Cory-Slechta & Robert Goyer)
12:00 p.m.	**Lunch at Hotel**	
1:00 p.m.	**CASAC Panel Discussion on Draft LRRP Activity IQ-Change Methodology, Charge Question 5:** ***Adaptation of Approach for Child-Occupied Facilities***	Dr. Henderson, Panel Members (Drs. Frank Speizer & Michael Rabinowitz)

Notes:

* The purpose of the public comment period on the second day of the meeting is to permit any members of the public who were unable to provide their oral comments on the first day with an opportunity to do so

** Periodic breaks will be taken as necessary and at the call of the Chair.

Tuesday, July 10, 2007 (continued)

1:45 p.m.	**CASAC Panel Discussion on Draft LRRP Activity IQ-Change Methodology, Charge Question 6:** ***Adaptation of Approach Using Age of Housing***	Dr. Henderson, Panel Members (Drs. Douglas Crawford-Brown & Ian von Lindern)
2:30 p.m.	**CASAC Panel Discussion on Draft LRRP Activity IQ-Change Methodology, Charge Question 7:** ***Adaptation of Approach for Exterior Renovation, Repair and Painting***	Dr. Henderson, Panel Members (Drs. Paul Mushak & Bruce Lanphear)
3:15 p.m.	**Break****	
3:25 p.m.	**CASAC Panel Discussion on Draft LRRP Activity IQ-Change Methodology, Charge Question 8:** ***Adaptation of Approach for Other Considerations***	Dr. Henderson, Panel Members (Dr. Barbara Zielinska & Mr. Sean Hays)
3:55 p.m.	**Summary, Wrap-Up, Next Steps and Closing Remarks**	Dr. Henderson
4:00 p.m.	**Adjourn Meeting**	Mr. Butterfield

Notes:

* Periodic breaks will be taken as necessary and at the call of the Chair.