

# DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

[Docket No. FR-4118-N-01]

## Fiscal Year 1996 NOFA for Research To Improve the Evaluation and Control of Residential Lead-Based Paint Hazards

**AGENCY:** Office of the Secretary—Office of Lead Hazard Control, HUD.

**ACTION:** Notice of funding availability (NOFA) for Fiscal Year (FY) 1996.

**SUMMARY:** This NOFA announces the availability of approximately \$2.5 million for grants or cooperative agreements for research on specified topics related to the evaluation and control of residential lead-based paint hazards. Approximately 5–10 grants or cooperative agreements of approximately \$100,000 to \$750,000 each will be awarded on a competitive basis. The application kit developed for this NOFA provides details to guide and assist applicants. This NOFA includes information concerning the following: (1) The purpose of the NOFA, eligible applicants, available amounts, and selection criteria; (2) Specified topics on which research grant applications will be accepted; (3) Application processing, including how to apply and how selections will be made; and (4) A checklist of steps and exhibits involved in the application process. An appendix to the NOFA identifies documents referenced in the NOFA.

**DATES:** An original and five copies of the completed application must be received by HUD no later than 3:00 P.M. (Eastern Time) on February 5, 1997. The application deadline is firm as to date and hour. In the interest of fairness to all competing applicants, the Department will treat as ineligible for consideration any application that is received after this deadline. Applicants should take this factor into account and make early submission of their materials to avoid loss of eligibility brought about by unanticipated delays or other delivery-related problems. Sections 4 and 5 of this NOFA provide further information on what constitutes proper submission of an application.

**ADDRESSES:** Application kits may be obtained from the Office of Lead Hazard Control (LS), Department of Housing and Urban Development, 451 7th Street, SW, Room B-133, Washington, DC 20410, or by calling Ms. Gail Ward at (202) 755-1785, ext. 111 (this is not a toll-free number), or by making an e-mail request to: Gail\_N.\_Ward@hud.gov (use underscore characters). The Department

is also planning to make the NOFA and application kit accessible via the Internet World Wide Web (<http://www.hud.gov/lea/leahome.html>). Completed applications, however, must be submitted in paper copy to the mailing address. Faxed or electronically transmitted applications will not be accepted.

**FOR FURTHER INFORMATION CONTACT:** Dr. Peter Ashley, Office of Lead Hazard Control (LS), Room B-133, 451 Seventh Street, SW, Washington, DC 20410; telephone (202) 755-1785, ext. 115 (this is not a toll-free number). For hearing- or speech-impaired persons, the telephone number may be accessed via TTY (text telephone) by calling the toll-free Federal Information Relay Service at 1-800-877-8339.

### SUPPLEMENTARY INFORMATION:

Table of Contents:

*Section 1. Paperwork Reduction Act Statement.*

*Section 2. Definitions.*

*Section 3. Purpose and Description.*

3.1. Purpose and Authority.

3.2. Background.

3.3. Allocation Amounts.

3.4. Eligible Applicants.

3.5. Goals, Objectives and Specific Research Topics.

3.5.1. Background and Objectives for Specific Research Topic Areas.

*Section 4. Grant Application Process.*

4.1. Submitting Applications for Grants.

4.2. Rating Factors.

*Section 5. Checklist of Application Submission Requirements.*

5.1. Applicant Data.

5.2. Certifications and Assurances.

*Section 6. Corrections to Deficient Applications.*

*Section 7. Findings and Certifications.*

Appendix A. Relevant Publications and Guidelines

### Section 1. Paperwork Reduction Act Statement

The information collection requirements contained in this notice have been submitted to the Office of Management and Budget (OMB) for approval in accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501-3520). The OMB control number, when assigned, will be announced by separate notice in the Federal Register. *An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the collection displays a valid control number.*

### Section 2. Definitions

The following definitions apply to this grant program:

**Abatement**—Any set of measures designed to permanently eliminate lead-based paint or lead-based paint hazards.

For the purposes of this definition, permanent means at least 20 years effective life. Abatement includes:

(a) The removal of lead-based paint and lead-contaminated dust, the permanent enclosure or encapsulation of lead-based paint, the replacement of components or fixtures painted with lead-based paint, and the removal or permanent covering of soil; and

(b) All preparation, cleanup, disposal, and post-abatement clearance testing activities associated with such measures.

**Cleaning**—The process of using a High Efficiency Particulate Air (HEPA) vacuum and/or wet cleaning agents to remove leaded dust. The process includes the removing of bulk debris from a work area.

**Clearance examination**—The visual examination and collection of environmental samples by an inspector or risk assessor upon completion of an abatement project or an interim control intervention. The clearance examination is conducted to ensure that lead exposure levels do not exceed HUD-recommended clearance standards. These recommended standards will be superseded by standards that are in the process of being established by the EPA Administrator pursuant to Title IV of the Toxic Substances Control Act, or other appropriate standards.

**Encapsulation**—The application of any covering or coating that acts as a barrier between the lead-based paint and the environment and that relies for its durability on adhesion between the encapsulant and the painted surface, and on the integrity of the existing bonds between paint layers, and between the paint and the substrate.

**Friction surface**—Any painted interior or exterior surface, such as a window or stair tread, subject to abrasion or friction.

**Guidelines** (*The Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* (June 1995))—HUD's manual of lead hazard control practices which provides detailed, comprehensive, technical information on how to identify lead-based paint hazards in housing and how to control such hazards safely and efficiently. (The *Guidelines* replace the HUD "Lead-Based Paint: Interim Guidelines for Hazard Identification and Abatement in Public and Indian Housing.")

**HEPA Vacuum**—(High Efficiency Particulate Air)—A vacuum cleaner fitted with a filter capable of removing particles of 0.3 microns or larger at 99.97 percent or greater efficiency from the exhaust air stream.

**Impact surface**—An interior or exterior surface (such as surfaces on

doors) subject to damage by repeated impact or contact.

**Interim Controls**—A set of measures designed to temporarily reduce human exposure or possible exposure to lead-based paint hazards. Such measures include specialized cleaning, repairs, maintenance, painting, temporary containment, and management and resident education programs. Interim controls include dust removal; paint film stabilization; treatment of friction and impact surfaces; installation of soil coverings, such as grass or sod; and restricting access to lead-contaminated soil.

**Lead-Based Paint**—Any paint, varnish, shellac, or other coating that contains lead equal to or greater than 1.0 mg/cm<sup>2</sup> as measured by XRF or laboratory analysis, or 0.5 percent by weight (5,000 µg/g, 5,000 ppm, or 5,000 mg/kg) as measured by laboratory analysis. (Local definitions may vary.)

**Lead-Based Paint Hazard**—Any condition which causes exposure to lead from lead-contaminated dust, lead-contaminated soil, lead-based paint that is deteriorated or present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects (as established by the EPA Administrator under Title IV of the Toxic Substances Control Act).

**Lead-Based Paint Hazard Control**—Activities to control and eliminate lead-based paint hazards, including interim controls and abatement of lead-based paint hazards or lead-based paint.

**Lead-Contaminated Dust**—Surface dust in residences that contains an area or mass concentration of lead in excess of the standard to be established by the EPA Administrator, pursuant to Title IV of the Toxic Substances Control Act. Until the EPA standards are established, the HUD-recommended clearance and risk assessment standards for leaded dust are 100 µg/ft<sup>2</sup> on floors, 500 µg/ft<sup>2</sup> on interior window sills, and 800 µg/ft<sup>2</sup> on window troughs (wells), exterior concrete or other rough surfaces.

**Lead-Contaminated Soil**—Bare soil on residential property that contains lead in excess of the standard established by the EPA Administrator, pursuant to Title IV of the Toxic Substances Control Act. The HUD-recommended standard is 400 µg/g for high-contact play areas and 2,000 µg/g in other bare areas of the yard. Soil contaminated with lead at levels greater than or equal to 5,000 µg/g should be abated by removal or paving.

**Lead Hazard Screen**—A means of determining whether residences in relatively good condition should have a full risk assessment.

**Microgram (µg)**—The prefix micro-means one-millionth. A microgram is one millionth of a gram.

**Replacement**—A strategy of abatement that entails the removal of building components coated with lead-based paint (such as windows, doors, and trim) and the installation of new components free of lead-based paint.

**Residential Dwelling**—This term means either:

- (1) A single-family dwelling, including attached structures, such as porches and stoops; or
- (2) A single-family dwelling unit in a structure that contains more than one separate residential dwelling unit and in which each unit is, or is intended to be used or occupied, in whole or in part, as the home or residence of one or more persons.

**Risk Assessment**—An on-site investigation to determine and report the existence, nature, severity and location of lead-based paint hazards in residential dwellings. Risk assessments include: information gathering regarding the age and history of the housing and occupancy by children under age 6, visual inspection, limited dust wipe sampling or other environmental sampling techniques, other activity as may be appropriate, and provision of a report explaining the results of the investigation.

**Substrate**—A surface on which paint, varnish, or other coating has been applied or may be applied. Examples of substrates include wood, plaster, metal, and drywall.

**Title X**—The Residential Lead-Based Paint Hazard Reduction Act of 1992 (Title X of the Housing and Community Development Act of 1992, Pub. L. 102-550, approved October 28, 1992).

**Window Trough**—For a typical double-hung window, the portion of the exterior window sill between the interior window sill (or stool) and the frame of the storm window. If there is no storm window, the window trough is the area that receives both the upper and lower window sashes when they are both lowered. Sometimes called the window "well".

**Wipe Sampling for Settled Lead-Contaminated Dust**—The collection of settled dust samples from surfaces to measure for the presence of lead. Samples must be analyzed by an accredited laboratory.

## Section 3. Purpose and Description

### Section 3.1. Purpose and Authority

HUD will award, at its discretion, research grants or cooperative agreements to selected applicants in order to fund research activities that

address critical gaps in the knowledge of residential lead hazard identification and control. Approximately \$2.5 million will be awarded to fund grants or cooperative agreements of approximately \$100,000 to \$750,000 each. These grants are authorized under sections 1051 and 1052 of Title X.

The purposes of this program include:

(a) Funding research on topics identified in sections 1051 and 1052 of Title X.

(b) Funding research that will be used to update the *Guidelines* and which is anticipated to:

- (1) Increase the accuracy and cost-effectiveness of lead hazard evaluation; and
- (2) Increase the efficacy and cost-effectiveness of lead hazard reduction.

### Section 3.2. Background

Lead is a potent toxicant that targets the central nervous system and is particularly damaging to the neurological development of young children. Lead-based paint is the most widespread and dangerous source of lead in the residential environment. Children can be exposed directly to this source of lead by ingesting paint chips or indirectly through exposure to paint-lead that has entered house dust and soil from the deterioration of interior and/or exterior lead-based paint. Studies have shown that the primary source of lead exposure for most young children is through the contact with and subsequent incidental ingestion of house dust (i.e., through hand-to-mouth activity). The amount of lead found in the ambient air, food and public drinking water has decreased significantly over the last two decades as a result of regulatory action and voluntary process changes.

Of all occupied housing units built before Congress banned the use of lead-based paint in 1978, approximately 83 percent, or 64 million housing units, are estimated to have lead-based paint somewhere on the exterior or interior of the building. Although intact lead-based paint poses little immediate risk to occupants, non-intact paint which is chipping, peeling, or otherwise deteriorating may present an immediate risk. Of particular concern are the housing units that contain deteriorated lead-based paint and/or lead-contaminated dust and are occupied by young children.

HUD has been actively engaged in a number of activities relating to lead-based paint as a result of the Lead-Based Paint Poisoning Prevention Act (LBPPPA) of 1971, as amended (42 U.S.C. 4801-4846). Sections 1051 and 1052 of Title X call for the Secretary of

HUD, in cooperation with other Federal agencies, to conduct research on specific topics related to the evaluation and subsequent mitigation of residential lead hazards.

In June 1995, HUD published the *Guidelines*, which describe state-of-the-art procedures for all aspects of lead-based paint hazard evaluation and control (see Appendix A of this NOFA). The *Guidelines* reflect the Title X framework for lead hazard control, which distinguishes three types of control measures: interim controls, abatement of lead-based paint hazards, and complete abatement of all lead-based paint. Interim controls are designed to address hazards quickly, inexpensively, and temporarily, while abatement is intended to produce a permanent solution. The *Guidelines* recommend procedures that are effective in identifying and controlling lead hazards while protecting the health of abatement workers and occupants.

HUD recognizes that targeted research and field experience will result in future changes to the *Guidelines* that will improve the accuracy of lead hazard evaluation and increase the effectiveness, while possibly reducing costs, of lead hazard control measures. HUD anticipates that increasing the cost-effectiveness of procedures for lead hazard evaluation and control will reduce barriers to the widespread adoption of these measures.

In July, 1995, the Task Force on Lead-Based Paint Hazard Reduction and Financing, which was established pursuant to section 1015 of Title X, presented its final report to HUD and the Environmental Protection Agency (EPA). The Task Force Report, entitled *Putting the Pieces Together: Controlling Lead Hazards in the Nation's Housing* (see Appendix A of this NOFA for a complete citation), recommended that research be conducted on a number of key topics in order to address significant gaps in our knowledge of lead exposure and hazard control. Key research topics which are to be addressed through this NOFA include the following (each of these topics is discussed in more detail in section 3.5.1 of this NOFA):

(a) The effectiveness of specialized cleaning methods for lead-contaminated dust, with an emphasis on the possible identification of less extensive, but comparably effective, alternatives to procedures recommended in the *Guidelines*.

(b) The most appropriate clearance methods to use following various hazard interventions; efficacy and cost-effectiveness of various protocols.

(c) The hazard posed by lead-contaminated dust in carpets and rugs,

and cost-effective hazard control interventions.

(d) The hazard posed by lead-contaminated dust in upholstered furniture, and cost-effective hazard control interventions.

(e) The utility of the lead risk assessment and screening protocols recommended in the *Guidelines*.

(f) Significance of lead-contaminated dust in forced air ducts in childhood lead exposure; appropriate methods for hazard evaluation and control.

### Section 3.3. Allocation Amounts

Approximately \$2.5 million will be available to fund research proposals in FY 1996. Grants or cooperative agreements will be awarded on a competitive basis following evaluation of all proposals according to the criteria described in section 4.3 of this NOFA. HUD anticipates that individual awards will range from approximately \$100,000 to approximately \$750,000. HUD reserves the right to grant one or more awards, or no awards, for research in a given topic area, depending on the quality of applications received.

### Section 3.4. Eligible Applicants

Academic and not-for-profit institutions located in the U.S., and State and local governments are eligible to apply for funding under this NOFA. For-profit firms are also eligible. However, they are not allowed to earn a fee (i.e., no profit can be made from the project). Federal agencies and Federal employees are not eligible to submit applications.

### Section 3.5. Goals, Objectives, and Specific Research Topics

(a) The overall goal of this research is to gain knowledge that will lead to improvements in the efficacy and cost-effectiveness of methods used for lead-based paint hazard evaluation and control. It is anticipated that this will eventually result in a reduction in the magnitude of childhood lead exposure nationwide by reducing barriers to the implementation of widespread lead-based paint hazard reduction interventions and improving the effectiveness of such interventions.

(b) Specific objectives for the individual research topics listed in section 3.2 of this NOFA are provided separately in the expanded discussion of these individual topic areas in section 3.5.1 of this NOFA. Although HUD is soliciting proposals for research on these specific topics, HUD will also consider funding applications for research on topics which, although not specifically listed in section 3.5.1 of this NOFA, are relevant under the overall

goals and objectives of this research, as described above. In such instances, the applicant should describe how the proposed research activity addresses these overall goals and objectives.

### Section 3.5.1. Background and Objectives for Specific Research Topic Areas

(a) *Cleaning of Hard Surfaces.* (1) *Background.* (i) Lead in house dust has been shown to be a major source of lead exposure for young children. Based on the understanding that lead-contaminated dust may not be visible to the naked eye and can be difficult to clean up, specialized cleaning to remove dust from noncarpeted surfaces is recognized as an essential element of all lead hazard control projects (the topics of leaded dust in carpets and upholstery are addressed separately in this section). The *Guidelines* recommend a cleaning procedure that includes a combination of HEPA vacuuming and wet cleaning with trisodium phosphate (TSP) or another cleaning agent designed for lead removal, or equivalent. Alternative methods are considered acceptable provided that they achieve at least the desired level of cleaning.

(ii) Chapter 14 of the *Guidelines* describes the specialized cleaning procedures recommended as a final pre-clearance step following completion of a lead hazard control project. Chapter 11 of the *Guidelines* presents the recommended specialized cleaning procedure to be employed as an interim control measure to remove lead-contaminated dust from a dwelling. When lead dust removal is used as an interim control measure, the *Guidelines* recommend that horizontal surfaces (e.g., floors, window sills and window troughs) and dust traps (e.g., radiators, registers/vents) be HEPA-vacuumed followed by wet washing with TSP or another specialized lead cleaner. Following lead hazard control activities that involve the disturbance of lead-based paint, the *Guidelines* recommend a more extensive cleaning process in which all ceilings, walls, noncarpeted floors and other horizontal surfaces be cleaned using a three-pass system (HEPA vacuuming, a wet wash, a final HEPA vacuum).

(iii) The specialized cleaning procedures recommended in the *Guidelines* are labor intensive and can contribute significantly to the total cost of a lead hazard intervention. Because relatively little research has been conducted on this topic, the recommended procedures are based primarily on the experience of researchers, the public housing lead abatement program, and the

recommendation of the peer review panel assembled for the *Guidelines*. The identification of comparably effective but less extensive and costly cleaning procedures could result in considerable cost savings, thus removing barriers to the widespread adoption of lead-dust control measures.

(iv) Anecdotal evidence from lead abatement contractors suggests that labor costs can be reduced (while still maintaining cleaning effectiveness) through modifications of the cleaning procedure recommended by the *Guidelines*. For example, some contractors have reported that they do not currently clean ceilings and walls using the three-pass system (HEPA vacuum/wet wash/HEPA vacuum), yet consistently meet HUD dust clearance levels. Contractors have also reported that they meet dust clearance levels by a considerable margin using a two-pass system of HEPA vacuum followed by a wet wash/rinse.

(v) The Canada Mortgage and Housing Corporation recently reported the results of a small-scale study which examined the effectiveness of four different cleaning procedures on hard floors following the creation of lead paint dust. The results from this limited investigation showed adequate floor cleaning following a two-pass procedure consisting of vacuuming with a shop vacuum followed by wet cleaning and rinsing using a specialized lead cleaner. Success was affected by the condition of the surface, however. HUD and the EPA recently sponsored a laboratory study which examined the effectiveness of various cleaning agents in removing lead dust from different surface types. Although peer review of the study was not yet complete during the writing of this NOFA, preliminary results indicate that observed differences in post-cleaning dust lead loading among substrates and surface types did not depend on which cleaner was used. Common, low phosphate cleaners were equally as effective as TSP in cleaning efficiency. Low surface tension cleaners were associated with slightly better cleaning; however, differences among cleaning agents was small. The study results also suggest that the level of physical effort may have a greater impact on cleaning effectiveness than does choice of cleaner. A study of similar design needs to be conducted under field conditions.

(vi) Another issue that needs to be systematically examined through controlled studies is the necessity of using a HEPA vacuum to achieve effective dust removal. In some situations, such as when cleaning is used as an interim control measure, it

may be possible to achieve adequate dust removal using more readily available vacuum cleaners such as shop vacuums that are fitted with collection bags that have a higher capture efficiency than standard bags, thus controlling the emission of lead particles in the exhaust stream. This could lead to additional cost savings and further reduce barriers to the widespread adoption of lead hazard reduction measures.

(vii) It is important to note that cleaning associated with commercial lead hazard reduction interventions beyond the level of custodial activities is covered by the Occupational Safety and Health Administration's (OSHA's) lead standard for the construction industry, which requires that vacuums used in conjunction with construction activities be equipped with a HEPA filter (see 29 CFR 1926.62(h)(4)). For activities that do not fall within OSHA's definition of "construction," other vacuums may be used if workers do not experience elevated exposures and, for work conducted in accordance with the *Guidelines*, if compliance with clearance standards is achieved.

(viii) Factors that need to be specifically addressed in the design of any research in this topic area include but are not limited to:

- The appropriateness for use of a given protocol in occupied vs. unoccupied dwellings;
- The effect of surface type, condition and porosity on achieving the desired level of cleanup;
- The cost and availability of cleaning supplies;
- The availability of electrical power in unoccupied homes;
- The size of the area to be cleaned;
- The presence or absence of adjacent areas that could cause recontamination; and
- Worker exposure to airborne lead particulate.

(2) *Research Goals and Objectives.* The overall goal is to identify the procedures for clean up of lead dust appropriate for use in various situations (e.g., varying surface types and levels of hazard reduction intervention, degrees of adhesion of dust, particle size) that will result in effective dust removal while minimizing time and/or costs.

Specific research objectives for this topic area include the following:

- (i) Determine whether the current recommendations in the *Guidelines* regarding the specific surfaces to be cleaned following lead hazard reduction interventions are necessary in order to reduce lead exposure risk to acceptable levels (e.g., as determined by lead dust loading on accessible surfaces). Of

particular interest are data that will clarify whether, and, if so, when, it is necessary to clean ceiling and/or wall surfaces following lead-based paint hazard reduction interventions.

(ii) Assess whether the rate of recontamination of "cleaned surfaces" is affected when a room receives only partial cleaning following a lead hazard reduction intervention.

(iii) Determine when the current recommendations in the *Guidelines* regarding the protocols for surface cleaning (i.e., the three-pass system following hazard reduction interventions, and the two-pass system for interim dust control) are necessary in order to consistently achieve desired reductions in lead surface loadings (e.g., as indicated by comparison with appropriate dust-lead clearance standards). When the currently recommended protocols are not necessary, determine what protocols provide sufficient surface cleaning under the various conditions examined.

(iv) Examine the effectiveness of different cleaning agents, including TSP and common low phosphate cleaners, when used in the field on different surface types.

(v) Obtain data on the effectiveness of different vacuum methods in cleaning dust from various surfaces and in controlling worker exposures to airborne lead. Of particular interest are the effectiveness and durability of vacuums that are less expensive and more readily available than HEPA vacuums, such as household or "shop vacuums" fitted with collection bags that have a greater particle capture efficiency than standard bags.

(b) *Clearance Testing.* (1) *Background.*

(i) Clearance testing (see Chapter 15 of the *Guidelines*) refers to the various environmental evaluation procedures used to determine if lead hazard control work was completed as specified and the area is safe for entry by unprotected workers or reoccupancy by residents.

(ii) The suggested protocol for clearance involves both a visual inspection to ensure that all work has been completed and that no visible dust or paint chips remain on cleaned surfaces, and the collection of environmental samples to ensure that potentially hazardous levels of lead do not remain in dust and soil. The *Guidelines* recommend that wipe samples of settled dust be collected from interior surfaces (hard floors, window sills, window troughs) and that soil samples be collected if exterior lead hazard control work was conducted. They recommend that clearance dust sampling be performed no sooner than one hour following completion of the

final cleanup to permit the settling of airborne dust.

(iii) Research is needed to address the question of which surfaces are the most appropriate to test for dust-lead loading following the completion of lead hazard reduction activities of varying intensity. The currently recommended protocol of collecting wipe samples from floors, window sills, and window troughs may not be the best approach for all situations. Other issues of interest with respect to clearance protocols include:

- The proper use of visual clearance procedures (e.g., Under what circumstances would visual clearance alone be sufficient? What visual clearance inspection procedures and criteria should be used?);

- The most cost-effective use of composite sampling during clearance testing; and

- Field validation of the minimum post-cleanup settling time of one hour that is recommended in the *Guidelines*.

(iv) Because clearance testing closely follows completion of final surface cleaning, applicants are encouraged to consider designing a project that addresses some of the objectives listed below for clearance testing as well as some of the objectives listed in section 3.5.1(a) of this NOFA ("*Cleaning of Hard Surfaces*").

(2) *Research Goals and Objectives.* The primary goal is to identify the most cost-effective protocols for clearance testing following the completion of lead hazard reduction interventions of varying intensities.

Specific research objectives include the following:

- (i) Identify the most appropriate surfaces to test for dust-lead loading following completion of lead hazard reduction activities of varying intensities (and subsequent cleanup);

- (ii) Determine under what circumstances (e.g., intervention intensity, project stage) the use of a visual clearance protocol alone would be sufficient;

- (iii) Determine the most cost-effective use of composite sampling when conducting clearance testing; and

- (iv) Conduct field validation of the minimum post-cleanup settling time of one hour (before clearance samples can be collected) that is currently recommended in the *Guidelines*, as well as alternative settling times.

(c) *Lead Hazard Identification and Control for Rugs and Carpets.* (1) *Background.* (i) Most of the research on the exposure hazard of lead-contaminated floor dust has involved the sampling of floor dust from hard surfaces. Studies have shown that rugs and carpets can act as traps for lead-

contaminated dust. However, there is relatively little information on their significance as sources of lead exposure.

(ii) More information is needed on the impact of leaded dust in rugs and carpets on the blood-lead (PbB) levels of children. It is also important that standardized methods be developed to sample dust from carpets and rugs; ideally, such methods should be relatively easy, inexpensive, and predictive of lead exposure hazard (i.e., blood lead level). Finally, more research is also needed on the development of practical and effective measures for reducing the levels of leaded dust in rugs and carpeting.

(iii) In the absence of sufficient quantitative data on the hazards posed by lead in carpets and area rugs, Chapter 5 of the *Guidelines* recommends that the lead clearance standard for hard floors (100 µg/ft<sup>2</sup> with wipe sampling) also be applied to carpeted floors. Chapter 11 of the *Guidelines* provides a recommended protocol for HEPA vacuuming area rugs, carpets, and upholstered furniture as an interim hazard control measure. The *Guidelines* further recommend that, because of the difficulty and cost of cleaning, highly contaminated or badly worn items be discarded.

(iv) Research is needed to identify cost-effective means of reducing the amount of leaded dust in rugs and carpets that would be available to young children. Published studies have reported that vacuum methods can reduce the amount of total dust in carpets and rugs, but it is not known whether vacuuming of these surfaces is effective in reducing the lead exposure of children living in treated homes. Some research has actually shown that limited vacuuming can result in an increase in lead loading levels on the carpet surface.

(v) It is likely that the most effective methods for reducing the amount of leaded dust in rugs and carpets will differ depending on factors such as the type of carpet material and its physical characteristics (e.g., carpet pile type and depth), the degree of contamination, the location of dust within the carpet pile, and degree of wear.

(vi) The results of several published studies have shown a statistically significant correlation between surface dust-lead loading in carpets (as measured by wipe or certain types of vacuum sampling) and the blood-lead levels of children. Vacuum dust samples from carpeted and noncarpeted floors within the same home have shown that carpet dust-lead loadings are generally one to three orders of magnitude greater than those for hard floors. There are limited data from wipe sampling,

however, indicating lower amounts of available lead on carpeted vs. noncarpeted surfaces.

(vii) The determination of surface dust-lead loading from carpets/upholstery, as measured by wipe sampling (or some vacuum protocols), may be a better estimate of exposure than total dust-lead loading as determined by vacuum methods which sample dust from below the carpet surface. This deeply embedded dust may be less available for contact by a child, but may be an important factor in determining surface dust-lead loading or rates of surface recontamination following cleaning.

(2) *Research Objectives.*

Specific research objectives include the following:

- (i) Assess the lead exposure risk to children posed by leaded dust in rugs and carpets and identify important modifying factors (e.g., type of material, type and depth of pile, location of dust within the pile, condition);

- (ii) Identify and evaluate a standard protocol for sampling leaded dust in rugs and carpets, which is practical, relatively inexpensive, and predictive of actual hazard; and

- (iii) Identify the most cost-effective methods for cleaning wall-to-wall or area rugs and carpets under various conditions. Relevant factors include, but are not limited to, type of material, depth and characteristics of pile, location of dust within the pile, and condition.

(d) *Lead Hazard Identification and Control for Upholstery.* (1) *Background.*

(i) As is true for rugs and carpets, upholstered furniture can also act as a trap for lead-contaminated dust. No significant published research has been identified on the exposure hazard posed by leaded dust in upholstered furniture or on the effectiveness of various hazard reduction interventions.

(ii) Chapter 11 of the *Guidelines* notes that it may be preferable to dispose of upholstered furnishings that are known to be highly contaminated with lead. As an interim dust control measure for upholstered surfaces, the *Guidelines* recommend that the surfaces be HEPA vacuumed with three to five passes over each surface at a total rate of approximately 5 square feet per minute. Upon completion of vacuuming, the *Guidelines* recommend that furniture be covered with a material that can be easily removed and washed.

(iii) Research is needed to determine the level of exposure to lead in upholstered furniture and, when necessary, appropriate and effective means for controlling this hazard. Because of similarities between research

on leaded dust in upholstery and in rugs and carpets (See section 3.5.1(c) of this NOFA), applicants are encouraged to consider research designs that would efficiently address the Department's research goals and objectives for both topic areas.

(2) *Research Objectives.*

Specific research objectives for this topic area include the following:

(i) Assess the lead exposure risk posed by lead-contaminated dust in upholstery and identify important modifying factors (e.g., type of furniture, type of upholstery material, condition).

(ii) Identify a standard protocol for sampling leaded dust in upholstery which is practical, relatively inexpensive, and predictive of actual exposure.

(iii) Identify the most cost-effective methods for cleaning upholstery under various conditions. Relevant factors include, but are not limited to:

- Type and construction of furniture;
- Type of upholstery material;
- Type and depth of pile;
- Surface characteristics;
- Condition; and
- Degree of contamination.

(iv) Evaluate the effectiveness of the protocol for cleaning upholstered furniture (i.e., HEPA vacuum followed by covering) recommended in the Guidelines.

(v) Assess the rate of recontamination of upholstery with leaded dust following cleaning and identify key factors affecting this.

(e) *Utility of Lead Risk Assessment and Screening Protocols.* (1) *Background.*

The Guidelines provide suggested protocols for conducting both risk assessments and lead hazard screens in both single and multifamily housing. A risk assessment is conducted in order to determine the presence or absence of lead-based paint hazards and suggest appropriate hazard control measures. A lead hazard screen employs a more limited sampling protocol and is intended for dwellings that are in relatively good condition. These protocols incorporate expert judgment and the best information available at the time the Guidelines were written. However, research is needed to validate and possibly improve upon the suggested protocols.

(2) *Research Goals and Objectives.*

The major goals are to assess under what conditions HUD's risk assessment and lead hazard screening protocols are accurate predictors of children's lead exposure and identify ways to improve the accuracy and increase the cost-effectiveness of these protocols.

Specific objectives for this research include the following:

(i) Determine whether or not the risk assessment approach outlined in the Guidelines is actually predictive of children's lead exposure. If the protocol is a valid assessment of lead exposure risk, it would be expected that, after accounting for other factors, children living in "high risk" dwellings would, on average, have higher blood-lead levels than those living in "low risk" dwellings.

(ii) Assess the utility of the "lead hazard screen protocol" set forth in the Guidelines. Determine under what conditions the suggested protocol, when used for both single and multifamily housing, is cost-effective and adequate in identifying dwellings that need a more thorough assessment without prompting an excessive number of unnecessary risk assessments.

(iii) Determine whether or not the number and type (e.g., dust sample locations) of environmental samples called for in the protocols under study is appropriate and cost-effective for both single and multifamily housing. Determine whether and, if so, under what conditions, the number and/or type of environmental samples can be reduced. Identify the most appropriate uses of "sample compositing" in order to maximize the amount and value of information obtained while minimizing costs.

(iv) Validate the "paint film quality" classification system presented in Chapter 5 (Risk Assessment) of the Guidelines. Specific points of interest include a determination of whether or not lead surface loadings are highest in dwellings containing paint classified as being in "poor" condition, and an evaluation of the appropriateness of the guidance regarding the extent (surface area) of deteriorated lead-based paint that determines the assignment of a surface or dwelling to a paint condition category (i.e., intact, fair, poor).

(v) Obtain and evaluate data on the contribution of leaded dust from friction and impact surfaces (particularly window and door components) to childhood lead exposure. These surfaces are defined as "lead based paint hazards" by Title X. However, relatively little research has been conducted on the significance of these surfaces as contributors to the overall dust lead loading of a dwelling or to childhood lead exposure.

(f) *Lead-Contaminated Dust in Forced Air Ducts.* (1) *Background.*

(i) Although some investigators have reported relatively high lead concentrations and loadings on the interior surfaces of forced air ducts, little is known regarding the significance of this dust in contributing

to childhood lead exposure. The degree to which this dust is mobile, and thus able to migrate into the living area of a residence, is likely the major factor in determining its significance as a lead exposure source. The mobility of dust in air ducts may be determined by a number of factors, including but not limited to:

- Particle size distribution;
- Chemical composition of the dust;
- The degree of dust-to-surface adhesion;
- Surface characteristics of the duct material; and
- The velocity of air movement within the duct.

(ii) Further research is needed to identify the most cost-effective protocol for cleaning dust from forced air ducts, and whether or not such cleaning and routine sampling are needed. Specific factors of interest include the rate of recontamination of duct surfaces following cleaning and precautions to prevent the contamination of living space during air duct cleaning.

(2) *Research Goals and Objectives.*

The major goal is to determine the significance of leaded dust in forced air ducts with respect to childhood lead exposure and, if applicable, identify safe, effective protocols for cleaning leaded dust from surfaces of forced air ducts.

Section 4. Grant Application Process

Section 4.1 *Submitting Applications for Grants*

(a) Information on NOFA application submission requirements, including deadline dates, is provided in the DATES section of the preamble to this NOFA. Information on where application kits may be obtained is provided in the ADDRESSES section of the preamble to this NOFA.

(b) Applications must conform to the formatting guidelines specified in the application kit. The kit specifies the sections to be included in the application and provides related formatting and content guidelines.

(c) HUD will review each application to determine whether the applicant is eligible in accordance with section 3.4 of this NOFA (Eligible Applicants). Applications that meet all of the threshold criteria will be eligible to be scored and ranked, based on the total number of points allocated for each of the rating factors described in section 4.2 of this NOFA.

(d) HUD intends to fund the highest ranked applications within topic areas and within the limits of funding availability. However, HUD may grant one or more awards, or no awards, for

research in a given topic area, depending on the quality of applications received. Applicants may address more than one of the research topic areas within their proposal. Also, projects need not address all of the objectives within a given topic area.

(e) HUD encourages applicants to plan projects that can be completed over a relatively short time period (e.g., 12 to 24 months from the date of award) so that any useful information that is generated from the research can be disseminated to the public as quickly as possible.

#### Section 4.2 Rating Factors

Applicants will be scored according to the following factors:

(a) *Competence of the Research Team (40 points)*. Major subfactors include the following:

(1) *The capability and qualifications of the principal investigator and key personnel (20 Points)*. Qualifications to design and carry out the proposed study as evidenced by academic background, relevant publications, and recent, relevant research experience that has produced useful results or findings.

(2) *Past performance of the research team in managing similar research (20 Points)*. Applicants should demonstrate that the project would have adequate administrative support, including clerical and specialized support in areas such as bookkeeping, accounting and equipment maintenance. Applicants must also demonstrate ability to successfully manage the various aspects of a complex research study in the following areas: logistics, research personnel management, data management, quality control, community research involvement (if applicable), report writing, and overall success in completing projects on time and within budget.

(c) *Quality of the Research Proposal (60 points)*. Major subfactors include the following:

(1) *Soundness of the study design (30 Points)*. The extent to which the study design is thorough and feasible, and displays a thorough knowledge of the relevant scientific literature. Applicants should include an appropriate plan for managing, analyzing, and archiving data.

(2) *Adequacy of the Project Management Plan (10 Points)*. The proposal should include an adequate management plan that provides a reasonable schedule for the completion of major tasks and deliverables, with an indication that there will be adequate resources (e.g., personnel, financial) to successfully meet the proposed schedule.

(3) *Adequacy of quality assurance mechanisms (10 Points)*. Quality assurance mechanisms must be well integrated into the study design in order to ensure the validity and quality of the results. Areas to be addressed include:

- (i) Acceptance criteria for data quality;
- (ii) Procedures for selection of samples/sample sites;
- (iii) Sample handling;
- (iv) Measurement and analysis; and
- (v) Any standard/nonstandard quality assurance/control procedures to be followed.

(4) *Responsiveness to solicitation objectives (10 Points)*. The likelihood that the research would make a significant contribution towards achieving some or all of HUD's stated goals and objectives for one or more of the topic areas described in section 3.5.1 of this NOFA.

(c) *Cost (No Points)*. The cost of the proposed project, while secondary, will be considered in addition to the factors stated above to determine the proposal most advantageous to the Government. Cost will be the deciding factor when proposals ranked under the above factors are considered acceptable and are substantially equal.

#### Section 5. Checklist of Application Submission Requirements

##### Section 5.1 Applicant Data

Applications must be submitted in accordance with the format and instructions contained in the application kit. Informal, incomplete, or unsigned applications will not be considered. The following is a checklist of the application contents that will be specified in the application kit:

(a) Completed Forms HUD-2880, Applicant/Recipient Disclosure/Update Report, and SF-LLL, Disclosure of Lobbying Activities, where applicable (See section 7, *Findings and Certifications*, of this NOFA).

(b) Standard Forms SF-424, 424A, 424B, and other certifications and assurances listed in section 5.2 of this NOFA.

(c) A detailed total budget with supporting cost justification for all budget categories of the Federal grant request (see application kit for details).

(d) An abstract containing the following information (See application kit for formatting instructions):

- (1) The project title;
  - (2) The names and affiliations of all investigators; and
  - (3) A summary of the study objectives, study design, total estimated cost, and the significance of the expected results.
- (e) *A description of the project*. This description must not exceed fifteen (15)

pages per topic area (see section 3.5 of this NOFA) (e.g., an applicant whose project addresses two topic areas is limited to a 30 page description), including visual materials such as charts and graphs. (See application kit for format and required elements.)

(f) Any important attachments, appendices, references, or other relevant information may accompany the project description, but must not exceed fifteen (15) pages.

(g) The biographical sketches of the principal investigator and other key personnel. These should be concise and limited to information that is relevant in assessing the qualifications of key personnel to conduct and/or manage the proposed research.

(h) Copy of State Clearing House Approval Notification (see application kit to determine if applicable).

#### Section 5.2 Certifications and Assurances

The following certifications and assurances are to be included in all applications:

(a) Compliance with all relevant State and Federal regulations regarding exposure to and proper disposal of hazardous materials.

(b) Compliance with relevant Federal civil rights laws and requirements (24 CFR 5.105(a)).

(c) Assurance that the financial management system meets the standards for fund control and accountability (24 CFR 84.21 or 24 CFR 85.20, as applicable).

(d) Assurance, to the extent possible and applicable, that any blood lead testing, blood lead level test results, and medical referral and updating will be conducted for children under six years of age according to the recommendations of the Centers for Disease Control and Prevention (CDC). (See Appendix A of this NOFA—*Preventing Lead Poisoning in Young Children*, October, 1991.)

(e) Assurance that HUD research grant funds will not replace existing resources dedicated to any ongoing project.

(f) The application shall contain any other assurances that HUD includes in the application kit under this NOFA, including certification of compliance with the Drug-Free Workplace Act of 1988 in accordance with the requirements set forth at 24 CFR part 24.

#### Section 6. Corrections to Deficient Applications

(a) Shortly after the expiration of the NOFA submission deadline date, HUD will notify applicants in writing of any technical deficiencies in the applications. A technical deficiency is



an item that is not necessary for HUD to evaluate for the purpose of scoring an application. Examples include omitted certifications or illegible signatures.

(b) The applicant may submit corrections, which must be received at the Office of Lead Hazard Control within 21 calendar days from the date of HUD's letter notifying the applicant of any minor deficiencies. Electronic or fax transmittal is not an acceptable transmittal mode.

(c) Corrections to technical deficiencies will be accepted within the 21-day time limit. Applicants who do not make timely response to a request for deficiency corrections shall be removed from further consideration for an award.

(d) Applicants shall be permitted to correct only technical deficiencies. Deficiencies determined by HUD to be substantive (i.e., those that would affect the scoring of an application) may not be corrected.

#### Section 7. Findings and Certifications

*Environmental Review.* A Finding of No Significant Impact with respect to the environment has been made in accordance with HUD regulations in 24 CFR part 50, which implements section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332). The Finding of No Significant Impact is available for public inspection during regular business hours in the Office of the General Counsel, Rules Docket Clerk, Department of Housing and Urban Development, 451 Seventh Street, SW, Room 10276, Washington, DC 20410.

*Federalism Executive Order.* The General Counsel, as the Designated Official under section 8(a) of Executive Order 12612, Federalism, has determined that the policies and procedures contained in this NOFA will not have substantial direct effects on States or their political subdivisions, or the relationship between the Federal government and the States, or the distribution of power and responsibilities among the various levels of government. Under this NOFA, grants or cooperative agreements will be made to support research activities which are anticipated to result in improvements in methods used to assess and mitigate residential lead hazards. Although the Department encourages States and local governments to conduct research in these areas, any such action by a State or local government is voluntary. Because action is not mandatory, this NOFA does not impinge upon the relationships between the Federal government and State and local

governments, and the notice is not subject to review under the Order.

*Family Executive Order.* The General Counsel, as the Designated Official under Executive Order 12606, The Family, has determined that this document will likely have a beneficial impact on family formation, maintenance and general well-being. This NOFA, insofar as it funds research on improved methods for the evaluation and control of residential lead hazards, will assist in preserving decent housing stock for low-income resident families. Accordingly, since the impact on the family is beneficial, no further review is considered necessary.

#### Section 102 of the HUD Reform Act—Documentation and Public Access Requirements—Applicant/Recipient Disclosures

(a) *Documentation and public access requirements.* HUD will ensure that documentation and other information regarding each application submitted pursuant to this NOFA are sufficient to indicate the basis upon which assistance was provided or denied. This material, including any letters of support, will be made available for public inspection for a five-year period beginning not less than 30 days after the award of the assistance. Material will be made available in accordance with the Freedom of Information Act (5 U.S.C. 552) and HUD's implementing regulations at 24 CFR part 15. In addition, HUD will include the recipients of assistance pursuant to this NOFA in its Federal Register notice of all recipients of HUD assistance awarded on a competitive basis. (See 24 CFR part 4 for further information on these documentation and public access requirements.)

(b) *Disclosures.* HUD will make available to the public for five years all applicant disclosure reports (HUD Form 2880) submitted in connection with this NOFA. Update reports (also Form 2880) will be made available along with the applicant disclosure reports, but in no case for a period less than three years. All reports—both applicant disclosures and updates—will be made available in accordance with the Freedom of Information Act (5 U.S.C. 552) and HUD's implementing regulations at 24 CFR part 15. (See 24 CFR part 4 for further information on these disclosure requirements.)

*Prohibition Against Lobbying Activities.* The use of funds awarded under this NOFA is subject to the disclosure requirements and prohibitions of section 319 of the Department of Interior and Related Agencies Appropriations Act for Fiscal

Year 1990 (31 U.S.C. 1352) (The "Byrd Amendment") and the implementing regulations at 24 CFR part 87. These authorities prohibit recipients of Federal contracts, grants, or loans from using appropriated funds for lobbying the Executive or Legislative branches of the Federal government in connection with a specific contract, grant, or loan. The prohibition also covers the awarding of contracts, grants, cooperative agreements, or loans unless the recipient has made an acceptable certification regarding lobbying.

Under 24 CFR part 87, applicants, recipients, and subrecipients of assistance exceeding \$100,000 must certify that no Federal funds have been or will be spent on lobbying activities in connection with the assistance. Indian Housing Authorities established by an Indian Tribe as a result of the exercise of their sovereign power are excluded from coverage, but IHAs established under state law are not excluded from coverage.

*Procurement Standards.* State and local government grantees are governed by and should consult 24 CFR part 85, which implements OMB Circular A-102 and details the procedures for subcontracts and sub-grants by States and local governments. Non-profit organizations are governed by 24 CFR part 84, which implements OMB Circular A-110. Under OMB A-102 and A-110, small purchase procedures can be used for subcontracts up to \$100,000, and require price or rate quotations from several sources (three is acceptable); above that threshold, more formal procedures are required. If States or local governments have more restrictive standards for contracts and grants, the State or local government standards can be applied. All grantees should consult and become familiar with either OMB A-102 or A-110, as appropriate, before issuing subcontracts or sub-grants.

*Catalog of Federal Domestic Number.* The Catalog of Federal Domestic Assistance Number for this program is 14.900.

*Davis-Bacon Act.* The Davis-Bacon Act does not apply to this program. However, if grant funds are used in conjunction with other Federal programs in which Davis-Bacon prevailing wage rates apply, then Davis-Bacon provisions would apply to the extent required under the other Federal programs.

*Section 103 of the HUD Reform Act.* HUD's regulation implementing section 103 of the Department of Housing and Urban Development Reform Act of 1989, codified as 24 CFR part 4, applies to the funding competition announced today. The requirements of the rule continue to



apply until the announcement of the selection of successful applicants. HUD employees involved in the review of applications and in the making of funding decisions are limited by part 4 from providing advance information to any person (other than an authorized employee of HUD) concerning funding decisions, or from otherwise giving any applicant an unfair competitive advantage. Persons who apply for assistance in this competition should confine their inquiries to the subject areas permitted under 24 CFR part 4.

Applicants or employees who have ethics related questions should contact the HUD Office of Ethics (202) 708-3815. (This is not a toll-free number.) For HUD employees who have specific program questions, such as whether particular subject matter can be discussed with persons outside HUD, the employee should contact the appropriate Field Office Counsel, or Headquarters counsel for the program to which the question pertains.

Authority: 42 U.S.C. 4854 and 4854a.

Dated: October 18, 1996.

David E. Jacobs,

*Director, Office of Lead Hazard Control.*

Appendix A—Relevant Publications and Guidelines

To Secure Any Of The Documents Listed, Call The Listed Telephone Number (generally not toll-free).

#### *Regulations*

1. Worker Protection: OSHA publication—Telephone: 202-219-4667

OSHA Regulations (available for a charge)—Government Printing Office—Telephone: 202-512-1800

—General Industry Lead Standard, 29 CFR 1910.1025; (Document Number 869022001124)

—Lead Exposure in Construction, 29 CFR 1926.62, and appendices A, B, C, and D; published 58 FR 26590 (May 4, 1993). (Document Number 869022001141)

2. Waste Disposal: 40 CFR parts 260-268 (EPA regulations)—Telephone 1-800-424-9346, or, from the Washington, DC metropolitan area, 1-703-412-9810 (not a toll-free number).

3. Lead; Requirements for Lead-Based Paint Activities; Proposed Rule: 40 CFR Part 745 (EPA) (State Certification and Accreditation Program for those engaged in lead-based paint activities), published on August 29, 1996 (61 FR 45778). Also available on the Internet World Wide Web (<http://www.hud.gov/lea/leahome.html>).

4. Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance; Proposed Rule: 24 CFR Parts 35, 36 and 37 (HUD), published on June 7, 1996 (61 FR 29170). Also available on the Internet World Wide Web (<http://www.hud.gov/lea/leahome.html>).

#### *Guidelines*

1. Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in

Housing; HUD, June 1995 (available for a charge)—Telephone: 800-245-2691, or on the Internet World Wide Web (<http://www.hud.gov/lea/leahome.html>).

Post-lead hazard control clearance, no more than:

100 Micrograms/sq.ft. (Bare and carpeted floors)

500 Micrograms/sq.ft. (Window sills)

800 Micrograms/sq.ft. (Window troughs (wells), exterior concrete and other rough surfaces)

2. Preventing Lead Poisoning In Young Children; Centers for Disease Control, October 1991: Telephone: 770-488-7330.

#### *Reports*

1. Putting the Pieces Together: Controlling Lead Hazards in the Nation's Housing, HUD, (Summary and Full Report), July 1995, (available for a charge)—Telephone 800-245-2691, or on the Internet World Wide Web (<http://www.hud.gov/lea/leahome.html>).

2. Comprehensive and Workable Plan for the Abatement of Lead-Based Paint in Privately Owned Housing: Report to Congress (HUD, December 7, 1990) (available for a charge)—Telephone 800-245-2691.

3. A Field Test of Lead-Based Paint Testing Technologies: Technical Report (Summary also available). U.S. Environmental Protection Agency, May 1995, EPA 747-R-95-002b. (available at no charge)—Telephone 800-424-5323.

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