

**DEPARTMENT OF HOUSING
AND URBAN DEVELOPMENT**

**HEALTHY HOMES
RESEARCH PROGRAM**

FUNDING AVAILABILITY FOR HEALTHY HOMES RESEARCH PROGRAM OVERVIEW

Purpose of the Program. To fund research to improve methods for detecting and controlling residential environmental health and safety (EHS) hazards. The purpose of the Healthy Homes Initiative is to develop, demonstrate and promote cost effective, preventive measures to correct multiple safety and health hazards in the home environment which produce serious diseases and injuries in children.

Available Funds. Approximately \$1.5 million.

Eligible Applicants. Academic and not-for-profit institutions located in the U.S., State and local governments, and Federally-recognized Indian tribes are eligible to apply. For-profit firms also are eligible; however, they are not allowed to earn a fee.

Application Deadline. May 17, 2001.
Match. None required.

Additional Information

If you are interested in applying for funding under this program, please review carefully the General Section of this SuperNOFA and the following additional information.

I. Application Due Date, Application Kits, Further Information, and Technical Assistance

Application Due Date. Submit an original and four copies of your completed application on or before 12:00 midnight, Eastern time, on May 17, 2001, at the address shown below.

See the General Section of this SuperNOFA for specific procedures that you must follow for the form of application submission (e.g., mailed applications, express mail, overnight delivery, or hand carried).

Address for Submitting Applications.
For Mailed Applications. The address for mailed applications is: Department of Housing and Urban Development, Office of Healthy Homes and Lead Hazard Control, 451 Seventh Street, SW, Room P3206, Washington, DC 20410.

For Overnight/Express Mail or Hand Carried Applications. The address for applications that are hand carried or sent via overnight/express mail delivery is: HUD Office of Healthy Homes and Lead Hazard Control, Suite 3206, 490 L'Enfant Plaza, SW, Washington, DC 20024. Hand carried applications will be accepted at this address (490 L'Enfant) up until 5:00 pm on the application due date.

After 5:00 pm on the application due date, hand carried applications will be accepted until 12:00 midnight, in the

South Lobby of HUD Headquarters, 451 Seventh Street, SW, Washington, DC 20410.

For Application Kits. You may obtain an application kit from the SuperNOFA Information Center at 1-800-HUD-8929. Persons with speech or hearing impairments may call the Center's TTY number at 1-800-HUD-2209. When requesting an application kit, please refer to the Healthy Homes Research grant program. Please be sure to provide your name, address (including zip code), and telephone number (including area code).

For Further Information and Technical Assistance. You may contact: Ms. Ellen Taylor, Office of Healthy Homes and Lead Hazard Control, at the address above; telephone (202) 755-1785, extension 116, or Ms. Karen Williams, Grants Officer, extension 118 (these are not toll-free numbers). Hearing- and speech-impaired persons may access the above telephone number via TTY by calling the toll-free Federal Information Relay Service at 1-800-877-8339.

Satellite Broadcast. HUD will hold an information broadcast via satellite for potential applicants to learn more about the program and preparation of the application. For more information about the date and time of the broadcast, you should consult the HUD web site at <http://www.hud.gov>.

II. Amount Allocated

Approximately \$1.5 million will be available to fund research proposals in FY 2001. Grants or cooperative agreements will be awarded on a competitive basis according to the Rating Factors described in Section V(B). HUD anticipates awarding three to five grants ranging from approximately \$200,000 to approximately \$600,000.

III. Program Description; Eligible Applicants; Eligible Activities

(A) *Program Description. Background.* In the FY 2001 Budget, HUD received a third year of funding to continue the Healthy Homes Initiative (sometimes referred to as the "Initiative" or "HHI") that protects children from housing conditions responsible for multiple diseases and injuries. The Initiative departs from the more traditional approach of attempting to correct one hazard at a time (e.g., asbestos, radon). In April 1999, HUD submitted to Congress a preliminary plan containing a full description of the Initiative. This description (Summary and Full Report) is available on the HUD website at www.hud.gov/offices/lead.

In addition to deficiencies in basic housing facilities that may impact

health, changes in the U.S. housing stock and more sophisticated epidemiological methods and biomedical research have led to the identification of new and often more subtle health hazards in the residential environment (e.g., indoor air quality hazards). While such hazards will tend to be found disproportionately in housing that is substandard (e.g. structural problems, lack of adequate heat, etc.), such housing-related environmental hazards may also exist in housing that is otherwise of good quality. Appendix A to this Healthy Homes Research program section of the SuperNOFA briefly describes the housing-associated health and injury hazards HUD considers key targets for intervention. Appendix B to this Healthy Homes Research program section of the SuperNOFA lists the references that serve as the basis for the information provided in this Healthy Homes Research section of this SuperNOFA.

HUD is interested in promoting approaches that are cost-effective and efficient and that result in the reduction of health threats for the maximum number of residents for the long run, and in particular low-income children. The overall goals and objectives of the HHI are:

(1) Mobilize public and private resources, involving cooperation among all levels of government, the private sector, and community-based organizations to develop the most promising, cost-effective methods for identifying and controlling housing-based hazards.

(2) Build local capacity to operate sustainable programs that will continue to prevent and, where they occur, minimize and control housing-based hazards in low and very low income residences when HUD funding is exhausted.

(3) Affirmatively further fair housing and environmental justice. HUD recognizes that there are many key scientific and implementation questions related to this Initiative, some of which were articulated in the HHI Preliminary Plan. With this NOFA, HUD hopes to advance the recognition and control of residential environmental health and safety hazards and more closely examine the link between housing and health.

(B) *Eligible Applicants.* Academic and not-for-profit institutions located in the U.S., State and local governments and Federally-recognized Indian tribes are eligible under all existing authorizations. For-profit firms also are 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. The General Section of the SuperNOFA provides additional eligibility requirements.

(C) *Eligible Activities.* (1) *General Goals and Objectives.* The overall goal of this research is to gain knowledge to improve the efficacy and cost-effectiveness of methods for evaluation and control of environmental health and safety hazards in the home. Through the Healthy Homes Initiative, HUD is assessing and promoting new risk reduction techniques and research on the control of key hazards described in Appendix A. Objectives to be addressed by these projects are:

(a) Investigation of the epidemiology of housing-related hazards and illness and injury.

(b) Development and assessment of low-cost test methods and protocols for identification and assessment of housing-related hazards.

(c) Development and assessment of cost-effective methods for reducing or eliminating housing-related hazards.

(d) Evaluation of the effectiveness of housing interventions and public education campaigns, and barriers and incentives affecting future use of the most cost-effective strategies.

(f) Investigation of the environmental health effects on children living in deteriorated housing and the impact on their development and productivity.

A table of examples of current Healthy Homes and lead-related research projects being funded by HUD can be found in Appendix C.

(2) HUD is interested in the following research topics:

(a) Evaluation of residential Environmental Health and Safety (EHS) hazard control methodologies.

—Controlling excess moisture and dust, and improving indoor air quality (e.g., controlling combustion products) have been identified as key areas in the HHI Preliminary Plan.

(b) Low-cost analytical techniques for the rapid, on-site determination of environmental contaminants of concern (e.g., bioaerosols, pesticides, allergens).

—Establish and validate any necessary procedures, such as extraction and/or digestion, that would work well with the field device/procedure.

—Examine old technology (e.g., colorimetric tests, titrimetric procedures) as well as newer techniques.

—Consider the safety and environmental impacts of the procedure, particularly as used in the field.

(c) New or Novel Methods of EHS Hazard Evaluation or Control, or other

areas of research that are consistent with the overall goals of this research program section of the SuperNOFA.

—Identify and evaluate new methods and/or techniques for EHS hazard control in the residential environment.

—Identify materials and/or procedures that may be used for abatement or for interim controls.

—Show the potential utility of these methods for hazard control and risk reduction.

—Evaluate critical elements and potential weaknesses of the methods or techniques, and address how to minimize the effect of each critical element and/or eliminate or mitigate each weakness.

—Demonstrate where and how these methods have been applied and tested, and/or perform demonstration activities.

—Illustrate the results obtained, and the costs involved.

—Recommend cost-effective changes to the Program for inclusion in future HUD Healthy Homes Initiative grants.

—Additional ideas will be considered with an open mind toward novel techniques and applications.

Although HUD is soliciting proposals for research on these specific topics, the Department will also consider funding applications for research on topics which 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.

Applicants should consider the efficiencies that might be gained by working cooperatively with some of the recipients of HUD Healthy Homes and Lead Hazard Control grants, who are widely distributed throughout the U.S. Information on current grantees is available at www.hud.gov/offices/lead.

You may address one or more of the research topic areas within your proposal, or submit separate applications for different topic areas. Projects need not address all of the objectives within a given topic area.

IV. Program Requirements.

(A) *Applicable Requirements.* Please refer to Section II of the General Section of the SuperNOFA, Requirements and Procedures Applicable to All Programs. The threshold requirements are listed in Section II.B of the General Section of this SuperNOFA.

(B) *Certifications and Assurances.* In addition to the certifications mentioned in the Section II(G) of the General Section of the SuperNOFA, you must comply with the following:

(1) All relevant State and Federal regulations regarding exposure to and proper disposal of hazardous materials.

(2) Any blood lead testing, blood lead level test results, and medical referral and follow-up for children under six years of age will be conducted according to the recommendations of the Centers for Disease Control and Prevention (CDC) *Preventing Lead Poisoning in Young Children*, (See Appendix B of this research program section of the SuperNOFA).

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

(4) Laboratory analysis covered by the National Lead Laboratory Accreditation Program (NLLAP) will be conducted by a laboratory recognized under the program.

(5) Human research subjects will be protected from research risks in conformance with Federal Policy for the Protection of Human Subjects, codified by HUD at 24 CFR part 60.

(6) The requirements of OSHA (e.g., 29 CFR part 1910 and/or 1926, as applicable), or the State or local occupational safety and health regulations, whichever are most stringent, will be met.

(C) *Period of Performance.* The period of performance cannot exceed 36 months from the time of award.

V. Application Selection Process

(A) *Submitting Applications for Grants.* Applications that meet all of the threshold requirements will be eligible to be scored and ranked, based on the total number of points allocated for each of the rating factors described below in Section V(B) of this program section of the SuperNOFA. Your application must receive a total score of at least 65 points to remain in consideration for funding.

Awards will be made in rank order, within the limits of funding availability.

You may address more than one of the research topic areas within your proposal, or submit separate applications for different topic areas. Projects need not address all of the objectives within a given topic area. While you will not be penalized for not addressing all of the specific objectives for a given topic area, if two applications for research in a given topic have equal scores, HUD will select the applicant whose project addresses the most objectives.

You are encouraged to plan projects that can be completed over a short time period (e.g., 12 to 24 months from the date of award) so useful information generated from the research can be available for policy or program

decisions and disseminated to the public as quickly as possible.

Regarding the amount to be awarded to the selected applicants, please refer to the Negotiations section in the General Section of this SuperNOFA.

(1) *Use of Residual Funds.* In the selection process, HUD reserves the right to offer partial funding to any or all applicants. If you are offered a reduced grant amount, you will have a maximum of seven (7) calendar days to accept such a reduced award. If you fail to respond within the seven day limit, you shall be considered to have declined the award.

(B) *Rating Factors.* The factors for rating and ranking applicants, and maximum points for each factor, are provided below. The maximum number of points to be awarded is 100. The EZ/EC bonus points described in the General Section of the SuperNOFA do not apply to this Research NOFA.

Rating Factor 1: Capacity of the Applicant and Relevant Organizational Experience (20 Points)

This factor addresses the extent to which you have the ability and organizational resources necessary to successfully implement your proposed activities in a timely manner. The rating of you, the "applicant," will include any sub-grantees, consultants, sub-recipients, and members of consortia that are firmly committed to the project (generally, "subordinate organizations"). In rating this factor HUD will consider the extent to which your application demonstrates:

(1) *The capability and qualifications of the principal investigator and key personnel* (10 points). Qualifications to carry out the proposed study as evidenced by academic background, relevant publications, and recent (within the past 10 years) relevant research experience. Publications and research experience are considered relevant if they required the acquisition and use of knowledge and skills that can be applied in the planning and execution of the research that is proposed under this program section of this SuperNOFA.

(2) *Past performance of the research team in managing similar research* (10 points). Demonstrated ability to successfully manage various aspects of a complex research study in such areas as logistics, research personnel management, data management, quality control, community research involvement (if applicable), and report writing, as well as overall success in project completion (i.e., research completed on time and within budget). You should also demonstrate that your

project would have adequate administrative support, including clerical and specialized support in areas such as accounting and equipment maintenance.

Rating Factor 2: Need/Extent of the Problem (15 Points)

This factor addresses the extent to which there is a need for your proposed program activities to address documented problems, target areas or target groups. In responding to this factor, you should document in detail how your 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 Sections III (A) and (C)(2)(a)-(c) of this program section of the SuperNOFA.

(1) Your rating will be based on the scope and completeness of your documentation which should include available data linking housing-based hazards to disease or injuries to children. Examples of data that might be used to demonstrate need include:

(a) Rates of childhood illnesses or injuries (e.g., asthma, burns) that could be caused or exacerbated by exposure to conditions in the home environment and/or rates of environmentally-related disease or adverse health effects (e.g., hypertension, elevated blood lead levels) that would be addressed by your research;

(b) Unavailability of other Federal, State or local funding or private sector resources that could be, or is used, to address the problem. This includes current research projects for which funding will be terminated or significantly reduced in the next 12 months.

(c) Data documenting affected groups or areas that are traditionally underserved or have special needs.

(2) If your application addresses needs that are in the Consolidated Plan, Analysis of Impediments to Fair Housing Choice (AI), court orders or consent decrees, settlements, conciliation agreements, and voluntary compliance agreements, you will receive more points than applicants that do not relate their program to identified need.

(3) In addition, if you are seeking funding for "other" research, as is described in section III(C)(2)(c), you must document the importance and need for the research with respect to addressing the overall goal of this research program, and providing measurable positive impact on children's health.

Rating Factor 3: Soundness of Approach (45 Points)

This factor addresses the quality of your proposed research plan. Specific components include the following:

(1) *Soundness of the study design* (25 points). The project description/study design must be thorough and feasible, and reflect your knowledge of the relevant scientific literature. You should include a plan for analyzing and archiving data. You should approach your study design as a project with a goal, some activities with associated tasks, a time frame, and an associated cost.

(2) *Quality assurance mechanisms* (8 points). You must describe the quality assurance mechanisms which will be integrated into your research design to ensure the validity and quality of the results. Areas to be addressed include acceptance criteria for data quality, procedures for selection of samples/sample sites, sample handling, measurement and analysis, and any standard/nonstandard quality assurance/control procedures to be followed. Documents (e.g., government reports, peer-reviewed academic literature) which provide the basis for your quality assurance mechanisms should be cited.

(3) *Project management plan* (5 points). The proposal should include a management plan that provides a schedule for the completion of major activities, tasks and deliverables, with an indication that there will be adequate resources (e.g., personnel, financial) to successfully meet the proposed schedule. Projects with a duration of 24 months or less will be awarded more points in this category than projects with a longer duration.

(4) *Project Evaluation* (5 points). You are required to identify and discuss the specific methods you will use to measure progress towards your goals, track and report results of your research, and evaluate the effectiveness of your project:

(i) Discuss the performance goals for your project and identify specific outcome measures;

(ii) Describe how the outcome information will be obtained, documented, and reported; and

(iii) Identify the major milestones for your project, and describe how your progress towards these milestones will be tracked, recorded and reported.

(5) *Budget Proposal* (2 Points). Your budget proposal should thoroughly estimate all applicable direct and indirect costs, and be presented in a clear and coherent format in accordance with the requirements listed in the

General Section of this SuperNOFA. HUD is not required to approve or fund all proposed activities. Your budget should be submitted in the format recommended; an electronic spreadsheet is available on HUD's website, www.hud.gov/offices/lead. You must thoroughly document and justify all budget categories and costs (Part B of Standard Form 424A) and all major tasks, for yourself, sub-recipients, partners, major subcontractors, joint venture participants, or others contributing resources to the project. Your budget proposal should be activity and task related.

Rating Factor 4: Leveraging Resources (10 Points)

Your proposal should demonstrate that the effectiveness of the HUD research grant funds are being increased by securing other public and/or private resources or by structuring the research in a cost-effective manner, such as integrating the project into an existing research effort. Resources may include funding or in-kind contributions (such as services, facilities or equipment) allocated to the purpose(s) of your research. Staff and in-kind contributions should be given a monetary value.

You should provide evidence of leveraging/partnerships by attaching to your application the following: letters of firm commitment, memoranda of understanding, or agreements to participate from those entities identified as partners in the research efforts. Each letter of commitment, memorandum of understanding, or agreement to participate should include the organization's name, proposed level of commitment (with monetary value) and responsibilities as they relate to specific activities or tasks of your proposed program. The commitment must also be signed by an official of the organization legally able to make commitments on behalf of the organization.

Rating Factor 5: Comprehensiveness and Coordination (10 Points)

You should describe how the results of your proposed research efforts will support planning, policy development, implementation of healthy homes programs, and/or public education in the area of residential EHS hazard control or in accordance with the goals and operations of the Partnership for Advancing Technology in Housing (PATH) (refer to Section VI(E) of the General Section of the SuperNOFA). If your application involves a particular community, it should relate to the community's Consolidated Plan and Analysis Impediments to Fair Housing Choice. In addition, you should also

address the extent to which your research could be used to expand fair housing choice and to affirmatively further fair housing.

VI. Application Submission Requirements

(A) *Applicant Data.* Your application must contain the items listed in this Section (VI(A)). These items include the standard forms, certifications, and assurances listed in the General Section of the SuperNOFA that are applicable to this funding (collectively, referred to as the "standard forms"). The standard forms can be found in Appendix B to the General Section of the SuperNOFA. The remaining application items that are forms (i.e., excluding such items as narratives), referred to as the non-standard forms can be found as Appendix D to this program section of the SuperNOFA: The items are as follows:

(1) Transmittal Letter that identifies what the research program funds are requested for, the dollar amount requested, and the applicant or applicants submitting the application. If two or more organizations are working together on the research, a primary applicant must be designated.

(2) Checklist and Submission Table of Contents (see Appendix D).

(3) The name, mailing address, telephone number, and principal contact person of the prime applicant. If you have consortium associates, sub-grantees, partners, major subcontractors, joint venture participants, or others contributing resources to your project, similar information must be provided for each of these entities.

(4) Completed Forms HUD-2880, Applicant/Recipient Disclosure/Update Report; Certification Regarding Lobbying; and/or SF-LLL, Disclosure of Lobbying Activities, where applicable.

(5) Completed Standard Forms SF-424, 424M, 424A, 424B, and other certifications and assurances listed in the General Section of the SuperNOFA and in Section VII(B) of this program section of the SuperNOFA.

(6) A detailed total budget with supporting cost justification for all budget categories of the Federal grant request. Use the budget format discussed in Section V(B) Rating Factor 3:5, above. (See Appendix D.)

(7) A two-page (maximum) abstract containing the following information: The project title, the names and affiliations of all investigators, and a summary of the objectives, expected results, and study design described in the proposal.

(8) A project description/narrative statement addressing the rating factors

for award of funding under this program section of the SuperNOFA. The narrative statement must be numbered in accordance with each factor for award (Rating Factors 1 through 5). The response to the rating factors should not exceed a total of 25 pages for each research topic area. Any pages in excess of this limit will not be read.

(9) Any important attachments, appendices, references, or other relevant information may accompany the project description, but must not exceed twenty (20) pages for the entire application. Any pages in excess of this limit will not be read.

(10) The resumes of the principal investigator and other key personnel. Resumes shall not exceed three pages each, and are limited to information that is relevant in assessing the qualifications of key personnel to conduct and/or manage the proposed research.

VII. Corrections to Deficient Applications

The General Section of the SuperNOFA provides the procedures for corrections to deficient applications.

VIII. Environmental Requirements

In accordance with 24 CFR 50.19(b)(1) and (5) of the HUD regulations, activities assisted under this program are categorically excluded from the requirements of the National Environmental Policy Act of 1969 (42 U.S.C. 4321) and are not subject to environmental review under the related laws and authorities.

IX. Authority

These grants are authorized under sections 1051 and 1052 of the Residential Lead Based Paint Hazard Reduction Act of 1992, which is Title X of the Housing and Community Development Act of 1992, sections 501 and 502 of the Housing and Urban Development Act of 1970, and the Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Act, 2001, Public Law 106-377, approved October 27, 2000.

Appendix A

The following briefly describes the housing-associated health and injury hazards HUD considers key targets for intervention:

Allergens and asthma: Experts estimate that 14 million Americans have asthma, with an associated annual cost of \$14 billion. Asthma is now recognized as the leading cause of school and work absence, emergency room visits and hospitalization. For

sensitized children, exposure to antigens from dust mites, certain pets, and cockroaches has been associated with more severe asthma. There is a preponderance of evidence showing a dose-response relationship between exposure and prevalence of asthma and allergies; some evidence also indicates that exposure to antigens early in life may predispose or hasten the onset of allergies and asthma. Dust mites have been identified as the largest trigger for asthma and allergies. Cockroach allergens appear to be excessive in 30–50% of inner-city housing and affect 5–15% of the population, whereas dust mite appears to be the dominant allergen in other environments.

Interventions known to have beneficial effects include installation of impervious mattress and pillow covers, which can reduce allergen exposure by 90%. Other dust mite control measures include dehumidification, laundering bedding, and removal of carpets and other dust sinks. Cleaning carpets with tannic acid solution has also been demonstrated to greatly reduce dust mites. Asthma prevention program costs have been estimated at about \$500 per unit, which includes about \$150 for educational interventions.

Asbestos: Asbestos is a mineral fiber that has been used commonly in a variety of building construction materials and household products for insulation and as a fire-retardant. The Environmental Protection Agency (EPA) and the Consumer Product Safety Commission (CPSC) have banned most asbestos products. Manufacturers have also voluntarily limited uses of asbestos. Today, asbestos is most commonly found in older homes: in pipe and furnace insulation materials, asbestos shingles, millboard, textured paints and other coating materials, and floor tiles. Elevated concentrations of airborne asbestos can occur when asbestos-containing materials (ACM) are disturbed by cutting, sanding or other remodeling activities. Improper attempts to remove these materials can release asbestos fibers into the air in homes, increasing asbestos levels and endangering people living in those homes. The most dangerous asbestos fibers are too small to be visible. After they are inhaled, they can remain and accumulate in the lungs. Asbestos can cause lung cancer, mesothelioma (a cancer of the chest and abdominal linings), and asbestosis (irreversible lung scarring that can be fatal). Most people with asbestos-related diseases were exposed to elevated concentrations on the job; some developed disease from exposure to clothing and equipment brought

home from job sites. As with radon, dose-response extrapolations suggest that lower level exposures, as may occur when asbestos-containing building materials deteriorate or are disturbed, may also cause cancer.

Intact asbestos-containing materials are not a hazard; they should be monitored for damage or deterioration and isolated if possible. Repair of damaged or deteriorating ACM usually involves either sealing (encapsulation) or covering (enclosure) it. Repair is usually cheaper than removal, but it may make later removal of asbestos more difficult and costly. Repairs should be done only by a professional trained and certified to handle asbestos safely and can cost from a few hundred to a few thousand dollars; removal can be more expensive.

Combustion products of heating and cooking appliances: Burning of oil, natural gas, kerosene, and wood for heating or cooking purposes can release a variety of combustion products of health concern.

Depending upon the fuel, these may include carbon monoxide (a chemical asphyxiant), oxides of nitrogen (respiratory irritants), polycyclic aromatic hydrocarbons (e.g., the carcinogen benzo[a]pyrene), and airborne particulate matter (respiratory irritants). Carbon monoxide, an odorless gas, can be fatal. Nitrogen dioxide can damage the respiratory tract, and sulfur dioxide can irritate the eyes, nose and respiratory tract. Smoke and other particulates irritate the eyes, nose and throat, and can cause lung cancer.

Improper venting and poor maintenance of heating systems and cooking appliances can dramatically increase exposure to combustion products. Experts recommend having combustion heating systems inspected by a trained professional every year to identify blocked openings to flues and chimneys; cracked or disconnected flue pipe; dirty filters; rust or cracks in the heat exchanger; soot or creosote build-up; and exhaust or gas odors. Installing a carbon monoxide detector is also recommended; however, such a detector will not detect other combustion by-products.

Insect and rodent pests: The observed association between exposure to cockroach antigen and asthma severity has already been noted above. In addition, cockroaches may act as vehicles to contaminate environmental surfaces with certain pathogenic organisms. Rodents can transmit a number of communicable diseases to humans, either through bites, arthropod vectors, or exposure to aerosolized excreta. In addition, humans can become sensitized to proteins in rodent

urine, dander and saliva. Such sensitization may contribute to asthma severity among children. Insect and rodent infestation is frequently associated with substandard housing that makes it difficult to eliminate. Treatment of rodent and insect infestations often includes the use of toxic pesticides which may present hazards to occupants (see below). Integrated pest management (IPM) for rodents and cockroaches, which reduces the use of pesticides, is estimated to cost approximately \$150 per unit. IPM control measures include sealing holes and cracks, removing food sources and use of traps.

Lead: Exposure to lead, especially from deteriorating lead-based paint, remains one of the most important and best-studied of the household environmental hazards to children. Although blood lead levels have fallen nationally, a large reservoir of lead remains in housing. The most recent national survey, conducted from 1991–94, showed that nearly one million U.S. preschoolers still have elevated blood lead levels. Overall, the prevalence rate among all children under six years of age is 4.4%. Among low-income children living in older housing where lead-based paint is most prevalent, the rate climbs to 16%; and for African-American children living in such housing, it reaches 21%.

HUD estimates that 64 million dwellings have some lead-based paint, and that 20 million have lead-based paint hazards. Of those, about 3.6 million have young children and of those, about 500,000 units have inadequate cash flow to respond to lead-based paint hazards. Costs can range anywhere from \$500 to \$15,000 per unit. Corrective measures include paint stabilization, enclosure and removal of certain building components coated with lead paint, and cleanup and “clearance testing”, which ensures the unit is safe for young children.

Mold and moisture: An analysis of several pulmonary disease studies estimates that 25% of airways disease, and 60% of interstitial lung disease may be associated with moisture in the home or work environment. Moisture is a precursor to the growth of mold and other biological agents, which is also associated with respiratory symptoms. An investigation of a cluster of pulmonary hemosiderosis (PH) cases in infants showed PH was associated with a history of recent water damage to homes and with levels of the mold *Stachybotrys atra* (SA) in air and in cultured surface samples. Associations between exposure to SA and “sick building” symptoms in adults have also been observed. Other related toxicogen

fungi have been found in association with SA-associated illness and could play a role. For sensitive individuals, exposure to a wide variety of common molds may also aggravate asthma. Addressing mold problems in housing requires coordination among the medical, public health, microbiological, housing, and building science communities.

The cost of mold/moisture-related intervention work (e.g., integrated pest management, clean and tune furnace, remove debris, vent clothes dryer, cover dirt floor with impermeable vapor barrier) is a few hundred dollars, unless major modification of the ventilation system is needed. In Cleveland, mold interventions, including repairs to ventilation systems and basement flooring, in the most heavily-contaminated homes range from \$500–\$5,000, with some costs also being dedicated to lead hazard control simultaneously through its lead+asthma program.

Pesticide residues: According to the EPA, 75 percent of U.S. households used at least one pesticide product indoors during the past year. Products used most often are insecticides and disinfectants. Another study suggests 80 percent of most people's exposure to pesticides occurs indoors and that measurable levels of up to a dozen pesticides have been found in the air inside homes. The amount of pesticides found in homes appears to be greater than can be explained by recent pesticide use in those households; other possible sources include contaminated soil or dust that migrates in from outside, stored pesticide containers, and household surfaces that collect and then release the pesticides. Pesticides used in and around the home include products to control insects (insecticides), termites (termiticides), rodents (rodenticides), molds and fungi (fungicides), and microbes (disinfectants). In 1990, the American Association of Poison Control Centers reported that some 79,000 children were involved in common household pesticide poisonings or exposures. In households with children under five years old, almost one-half stored at least one pesticide product within reach of children. Exposure to chlorpyrifos (CP), a commonly used organophosphate insecticide, in the prenatal and early postnatal period may impair neurodevelopment. While CP is a biodegradable pesticide, substantial persistence of CP in house dust has been demonstrated. Exposure to high levels of cyclodiene pesticides, commonly associated with misapplication, has produced various symptoms, including headaches, dizziness, muscle twitching, weakness, tingling sensations, and nausea. In addition, EPA is concerned that cyclodienes might cause long-term damage to the liver and the central

nervous system, as well as an increased risk of cancer.

There are available data on hazard evaluation methods and remediation effectiveness regarding pesticide residues in the home environment.

Radon progeny: The National Academy of Sciences estimates that approximately 15,000 cases of lung cancer per year are related to radon exposure. Epidemiologic studies of miners exposed to high levels of radon in inhaled air have defined the dose response relation for radon-induced lung cancer at high exposure levels. Extrapolation of these data has been used to estimate the excess risk of lung cancer attributable to exposure to radon gas at the lower levels found in homes. These estimates indicate that radon gas is an important cause of lung cancer deaths in the U.S. Excessive exposures are typically related to home ventilation, structural integrity and location.

Radon measurement and remediation methods are well-developed, and the Environmental Protection Agency (EPA) recommends that every home be measured for radon. EPA estimates that materials and labor costs for radon reduction in an existing home are \$800–\$2500. Including radon resistant techniques in new home construction costs \$350–\$500, and can save up to \$65 annually in energy costs, according to the EPA.

Take home hazards from work/hobbies and work at home: When the clothing, hair, skin, or shoes of workers become contaminated with hazardous materials in the workplace, such contaminants may inadvertently be carried to the home environment and/or an automobile. Such "take-home" exposures have been demonstrated, for example, in homes of lead-exposed workers. In addition, certain hobbies or workplaces located in the home may provide an especially great risk of household contamination.

Control methods include storing and laundering work clothes separately, and showering and changing before leaving work, or immediately after arriving home. Once a home becomes contaminated, cleaning floors and contact surfaces and replacing furnishings may be necessary to reduce exposures.

Unintentional injuries/fire: Unintentional injury is now the leading cause of death and disability among children younger than 15 years of age. In 1997, nearly 7 million persons in the United States were disabled for at least 1 full day by unintentional injuries received at home. During the same year, 28,400 deaths were attributable to unintentional home injuries, of which 1800 occurred among children 0–4 years of age. Among young children, three types of events accounted for more than ¾ of deaths: fires/

burns, drownings, and mechanical suffocation. Falls and poisoning are the next most common.

Home visitation protocols have been shown to be effective in reducing exposure to such hazards. The "add-on" cost of injury prevention measures, when combined with other housing interventions are estimated at about \$100 per unit. This includes the cost of some injury prevention devices, such as smoke alarms, electrical socket covers, etc.

Appendix B—Relevant Publications and Guidelines

To secure any of the documents listed, call the listed telephone number (generally, the telephone numbers are not toll-free).

Regulations: 1. Worker Protection: OSHA publication—Telephone: 202–693–1888 (OSHA Regulations) (available for a charge)—Government Printing Office—Telephone: 202–512–1800 (not a toll-free number):

—General Industry Lead Standard, 29 CFR 1910.1025 (Document Number 869022001124). Can be downloaded from the Internet without charge from www.osha-slc.gov/OshStd_data/1910_1025.html.

—Lead Exposure in Construction, 29 CFR 1926.62, and appendices A, B, C, and D (Document Number 869022001141). Can be downloaded from the Internet without charge from www.osha-slc.gov/OshStd_data/1926_0062.html.

2. Waste Disposal: 40 CFR parts 260–268 (EPA regulations) (available for a charge)—Telephone 1–800–424–9346, or, from the Washington, DC, metropolitan area, 1–703–412–9810 (not a toll-free number). Can be downloaded from the Internet without charge from www.epa.gov/docs/epacfr40/chapt-I.info/subch-I/.

3. Lead; Requirements for Lead-Based Paint Activities in Target Housing and Child-Occupied Facilities; Final Rule: 40 CFR part 745 (EPA) (Lead Hazard Standards, Work Practice Standards, EPA and State Certification and Accreditation Programs for those engaged in lead-based paint activities)—Telephone: 1–202–554–1404 (Toxic Substances Control Act Hotline) (not a toll-free number). Can be downloaded from the Internet without charge from www.epa.gov/opptintr/lead/index.html.

4. Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance; Final Rule: 24 CFR part 35, subparts A through R, published September 15, 1999, at **Federal Register** pages 50201 through 50231 (HUD)—Telephone: 1–800–424–LEAD (National Lead

Information Center). Can be downloaded from the Internet without charge from www.hud.gov/lea/leadwnlo.html or www.epa.gov/lead/leadbase.htm.

5. U.S. Environmental Protection Agency. Lead; Identification of Dangerous Levels of Lead; Final Rule at 66 FR 1205-1240, January 5, 2001. TSCA Hotline: 202-554-1404 (not a toll-free number). Can be downloaded from the Internet without charge from www.epa.gov/lead/leadhaz.htm.

Guidelines: 1. Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing; HUD, June 1995, and amended September, 1997. (Available for a charge)—Telephone: 800-245-2691. Can be downloaded from the Internet without charge from www.hud.gov/lea/leadwnlo.html.

2. Preventing Lead Poisoning in Young Children; Centers for Disease Control, October 1991; Telephone: 888-232-6789.

3. Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials, November 1997; Centers for Disease Control and Prevention (CDC); Telephone: 888-232-6789. Can be downloaded from the Internet without charge from www.hud.gov/lea/leadwnlo.html.

Reports and Articles: 1. Putting the Pieces Together: Controlling Lead Hazards in the Nation's Housing, (Summary and Full Report); HUD, July 1995 (available for a charge)—Telephone 800-245-2691. Can be downloaded from the Internet without charge from www.hud.gov/lea/leadwnlo.html.

2. The Healthy Homes Initiative: A Preliminary Plan (Summary and Full Report); HUD, July 1995. Can be downloaded from the Internet without charge from www.hud.gov/lea/leadwnlo.html.

3. Institute of Medicine. Indoor Allergens. Assessing and Controlling Adverse Health

Effects. National Academy Press. Washington, D.C. 1993.

4. Mott L., Our Children at Risk. Natural Resources Defense Council. Washington, D.C. 1997. Can be ordered from the Internet from www.nrdc.org

5. Rom W.N., Ed. Environmental and Occupational Medicine. Little, Brown and Co., Boston. 1992.

6. President's Task Force on Environmental Health Risks and Safety Risks to Children. Asthma and The Environment: An Action Plan to Protect Children. Washington, D.C. 1999. Eliminating Childhood Lead Poisoning: A Federal Strategy Targeting Lead Paint Hazards. Washington, D.C., 2000. Can be downloaded from the Internet without charge from www.epa.gov/children.

BILLING CODE 4210-32-P

APPENDIX C + Healthy Homes and Lead-Related Research

Examples of Healthy Homes Research

No.	Title	Description
1	Urban Mold and Moisture	Provide data on the environmental impact on homes and on the health of children associated with mold and moisture control (research component of demonstration project)
2	Mold and Moisture in Inner City Housing	Demonstrate and evaluate the efficacy of low cost moisture control services through environmental, biological and medical monitoring (research component of demonstration project)
3	Bedford-Stuyvesant Healthy Homes Initiative	Demonstrate and evaluate the efficacy of low cost hazard remediation by tenants and owners in addressing four types of home environmental hazards (lead paint and dust, allergens, mold and accidental injury) (research component of demonstration project)
4	Boston Healthy Homes Partnership	Compare the efficacy of "enhanced" vs. "standard" intervention packages in reducing asthma exacerbation (research component of demonstration project)
5	Long Beach Healthy Home Initiative	Compare the efficacy of healthy homes interventions vs. standard environmental health services provided by a health department conducting a lead hazard control program (research component of demonstration project)
6	Improving the Lead Dust Final Clean Protocol to Reduce Cockroach Allergen Exposure	Determine effectiveness of modified cleaning protocols in reducing household contamination by cockroach allergen; evaluate polyclonal detection assay for cockroach allergens
7	Healthy Public Housing	Document EHS hazards affecting public housing residents; evaluate remedial measures and quantify economic benefits of interventions
8	Head Start Healthy Homes Initiative	Evaluate home visitation to Head Start families as a means of reducing health risks for asthma, lead poisoning and injury.

Examples of Healthy Homes-Related Lead Research

No.	Title	Description
1	Sampling Lead Dust in Carpets and Upholstery	To compare the performance of 5 different methods (handwash, vacuum, wipe, adhesive label, and a "membrane" sampler) of sampling dust-lead from carpets and upholstery in homes of lead poisoned children.
2	Lead Hazard Assessment of Carpets	Examine transfer of particles from carpet to hands (conditioned and field samples), distribution of dust and lead within carpet pile, and potential exposure to particulate in "particle cloud" created when walking on carpet.
3	Lead Hazard of Upholstery	The primary objective is to assess the potential for exposure to dust-lead from upholstery (conditioned samples and field samples).
4	Lead Hazard Assessment of Residential Air Ducts Emissions	Laboratory phase will measure lead particle emissions from a simulated household ventilation duct system under varying conditions (air velocity, humidity, etc.).
5	Efficacy of Household Vacuums and a Nonphosphate Detergent in Reducing Lead Dust on Floors	Conduct lab testing of household vacuums to select 3 moderately priced vacuums for use in the field component of the study. Compare the performance of the household vacuums with a HEPA vacuum in cleaning lead-contaminated dust. Identify parameters predictive of performance.
6	Factors Affecting the Retention of Leaded Dust in Carpets	The research will identify major factors (e.g., pile height, fiber density, fiber coating) which affect the extent to which carpets can be cleaned of leaded dust in the laboratory and field.
7	Penetration of Particulate Through Vacuum Bags	Develop a method for laboratory testing of commonly available vacuum cleaner bags to determine their efficiency in trapping fine dust.
8	Cleaning Lead Contaminated Dust from Hard Surfaces	The purpose of this research is to determine the effectiveness of various detergents in cleaning lead-contaminated dust from hard surfaces under varying conditions of wear and dust loading.
9	Monitoring HEPA Vacuum Dust Pick-up with an Aerosol Photometer	The objective of this research is develop a dynamic reading instrument that will indicate when a surface is sufficiently "clean".

APPENDIX D

The non-standard forms, which follow, are required for your Healthy Homes Research application. They are the Checklist and Submission Table of Contents and the Total Budget (Federal Share and Matching Contribution, including instructions).

CHECKLIST AND SUBMISSION TABLE OF CONTENTS

HEALTHY HOMES RESEARCH NOFA

The following checklist is provided to ensure that you have submitted all of the required items in order for you to receive consideration for funding under this NOFA. Applicants must check off each item that they have included in their submission package and note the corresponding page number where the response is located. Applicants are to include this Checklist and Submission Table of Contents with the proposal. Application pages must be consecutively numbered.

<u>Check Off</u>	<u>Page Number</u>
<input type="checkbox"/> Transmittal Letter	Cover page
<input type="checkbox"/> Checklist And Submission Table Of Contents (this form)	p. ____
<input type="checkbox"/> Project Abstract (limited to 2 pages)	p. ____
 Application Forms	
<input type="checkbox"/> Standard Form 424 (Application for Federal Assistance)	p. ____
<input type="checkbox"/> Standard Form 424M (Federal Assistance Funding Matrix)	p. ____
<input type="checkbox"/> Standard Form 424A (Budget Information/ Non-Construction Programs)	p. ____
<input type="checkbox"/> Total Budget (Federal Share and Matching) (Budget sheets provided for applicant and each major subgrantees/subcontractor.)	p. ____
<input type="checkbox"/> HUD 2880 Disclosure and Update Report	p. ____
<input type="checkbox"/> HUD 50070 Drug-Free Workplace Certification	p. ____
<input type="checkbox"/> HUD 50071 Certification of Payments to Influence Federal Transactions	p. ____
<input type="checkbox"/> Form SF-LLL Disclosure of Lobbying Activities Required	p. ____
<input type="checkbox"/> Form SF-LLL not required.	
<input type="checkbox"/> HUD 2992 Certification of Status Regarding Debarred Applicants	p. ____
<input type="checkbox"/> Standard Form 424B (Assurances/Non-Construction Programs)	p. ____
 Response to Rating Factors/Project Description (limited to 25 pages)	
<input type="checkbox"/> 1. Capacity of the Applicant and Relevant Organizational Experience	p. ____
<input type="checkbox"/> 2. Needs/Extent of the Problem	p. ____
<input type="checkbox"/> 3. Soundness of Approach	p. ____
<input type="checkbox"/> 4. Leveraging/Partnerships	p. ____
<input type="checkbox"/> 5. Comprehensiveness and Coordination	p. ____
 Appendices (if applicable)	
<input type="checkbox"/> Appendix 1 - Material in support of Rating Factors 1 through 5 (Limited to 20 pages.)	p. ____
<input type="checkbox"/> Appendix 2 - Materials relating to the forms	p. ____
<input type="checkbox"/> Appendix 3 -Other materials related to the application	p. ____
<input type="checkbox"/> HUD 2993 Acknowledgment of Application Receipt	p. ____

Spreadsheet version available from www.hud.gov/lea/eaforms.html

Budget Summary

Total Budget (Federal Share and Matching)

Detailed Description of Budget					
3c. Transportation - Other	Quantity	Unit Cost	Estimated Cost	Federal Share	Match
Subtotal - Transportation - Other					
3d. Per Diem or Subsistence (indicate location)	Days	Rate per Day	Estimated Cost	Federal Share	Match
Subtotal - Per Diem or Subsistence					
Total Travel Cost					
4. Equipment (Only items over \$5,000 each)	Quantity	Unit Cost	Estimated Cost	Federal Share	Match
Total Equipment Cost					
5. Supplies and Materials (Items under \$5,000)					
5a. Consumable Supplies	Quantity	Unit Cost	Estimated Cost	Federal Share	Match
Subtotal - Consumable Supplies					
5b. Non-Consumable Materials	Quantity	Unit Cost	Estimated Cost	Federal Share	Match
Subtotal - Non-Consumable Materials					
Total Supplies and Materials Cost					

Spreadsheet version available from www.hud.gov/lea/leaforms.html

Analysis of Total Estimated Costs	Estimated Cost	Percent of Total	Percent of Labor
1 Personnel (Direct Labor)			
2 Fringe Benefits			
3 Travel			
4 Equipment			
5 Supplies and Materials			
6 Consultants			
7 Contracts and Sub-Grantees			
8 Other Direct Costs			
9 Indirect Costs			
Total			

**Federal Share
Match**

Expressed as a percentage of the Federal Share

Some cells in this spreadsheet are protected. There is no password for this spreadsheet.

Instructions for Completing the Budget Summary Spreadsheet

Note: an electronic version of this spreadsheet may be obtained from the HUD Office of Healthy Homes and Lead Hazard Control website at www.hud.gov/lea/leaforms.html

Item	Discussion
1 - Personnel (Direct Labor)	<p>This section should show the labor costs for all individuals supporting the grant effort (regardless of the source of their salaries). The hours and costs are for the full life of the grant. If an individual is employed by a contractor or sub-grantee, their labor costs should not be shown here.</p> <p>Please include all labor costs which are associated with the proposed grant program, including those costs which will be paid for with in-kind or matching funds.</p> <p>Do not show fringe or other indirect costs in this section.</p> <p>Please use the hourly labor cost for salaried employees (use 2080 hours per year or the value your organization uses to perform this calculation). An employee working less than full time on the grant should show the numbers of hours they will work on the grant.</p>
2 - Fringe Benefits	<p>Use the standard fringe rates used by your organization. You may use a single fringe rate (a percentage of the total direct labor) or list each of the individual fringe charges. The spreadsheet is set up to use the Total Direct Labor Cost as the base for the fringe calculation. If your organization calculates fringe benefits differently, please use a different base and discuss how you calculate fringe as a comment.</p>
3 - Travel	
3a - Transportation - Local Private Vehicle	<p>If you plan on reimbursing staff for the use of privately owned vehicles or if you are required to reimburse your organization for mileage charges, show your mileage and cost estimates in this section.</p>
3b - Transportation - Airfare	<p>Show the estimated cost of airfare required to support the grant program effort. Show the destination and the purpose of the travel as well as the estimated cost of the tickets.</p> <p>Each lead program NOFA discusses the travel requirements which should be listed here.</p>
3c - Transportation - Other	<p>If you or are charged monthly by your organization for a vehicle for use by the grant program, indicate those costs in this section.</p> <p>Provide estimates for other transportation costs which may be incurred (metro, etc.).</p>

3d - Per Diem or Subsistence	<p>For travel which will require the payment of subsistence or per diem in accordance with your organization's policies. Indicate the location of the travel.</p> <p>Each lead program NOFA discusses the travel requirements which should be listed here.</p>
4 - Equipment	<p>Equipment is defined by HUD regulations as tangible, nonexpendable, personal property having a useful life of more than one year and an acquisition cost of \$5,000 or more per unit.</p> <p>Each lead program NOFA describes what equipment may be purchased using grant funding.</p>
5 - Supplies and Materials	<p>Supplies and materials are consumable and non-consumable items which have a unit value of less than \$5,000. Please list the proposed supplies and materials as either Consumable Supplies or as Non-Consumable Materials.</p>
5a - Consumable Supplies	<p>List the consumable supplies you propose to purchase. General office or other common supplies may be estimated using an anticipated consumption rate.</p>
5b - Non-consumable materials	<p>List furniture, computers, printers, and other items which will not be consumed in use. Please list the quantity and unit cost.</p>
6 - Consultants	<p>Please indicate the consultants you will use. Indicate the type of consultant (skills), the number of days you expect to use them, and their daily rate.</p>
7 - Contracts and Sub-Grantees	<p>List the contractors and sub-grantees which will help accomplish the grant effort. Other contracts which should be shown here include inspections, risk assessments, and clearance inspections; contracts with Community Based Organizations; liability insurance; contracts with laboratories; and training and certification for contractors and workers.</p> <p>If any contractor, sub-contractor, or sub-grantee is expected to receive over 10% of the total Federal amount requested, a separate Budget Summary spreadsheet should be developed for that contractor or sub-grantee and the total amount of their proposed effort should be shown as a single entry in this section.</p> <p>Unless your proposed program will perform the primary grant effort (lead hazard control, research, or healthy homes) with in-house employees (which should be listed in section 1), the costs of performing the primary grant activities (research, hazard control, etc.) should be shown in this section.</p> <p>Types of activities which should be shown in this section:</p> <ul style="list-style-type: none"> • Contracts for all services • Training for individuals not on staff • Contracts with Community Based Organizations or Other Governmental Organizations (note the 10% requirement discussed above) • Insurance if your program will procure it separately

	Please provide a short description of the activity the contractor or subgrantee will perform, if not evident.
8 - Other Direct Costs	<p>Other Direct Costs include a number of items that are not appropriate for other sections.</p> <p>Other Direct Costs may include:</p> <ul style="list-style-type: none"> • Staff training • Telecommunications • Printing and postage • Relocation, if costs are paid directly by your organization (if relocation costs are paid by a subgrantee, it should be reflected in Section 7)
9 - Indirect Costs	<p>OMB Circular A87 defines indirect costs are those that have been incurred for common or joint purposes. These costs benefit more than one cost objective and cannot be readily identified with a particular final cost objective without effort disproportionate to the results achieved. Indirect costs include (a) the indirect costs originating in each department or agency of the governmental unit carrying out Federal awards and (b) the costs of central governmental services distributed through the central service cost allocation plan and not otherwise treated as direct costs.</p> <p>The spreadsheet is set up to use the Total Direct Labor plus the Fringe Benefits costs as the base for the indirect cost calculation. If your organization calculates indirect costs differently, please use a different base and discuss how you calculate fringe as a comment.</p>

The three rightmost columns allow you to identify how the costs will be spread between the Federal Share and the Match. This information will help the reviewers better understand your program and priorities. The far right column is an "error checking" function to confirm that the estimated cost is equal to the sum of the Federal Share and the Match. If there is a discrepancy, the word "Error" will appear.

Note: The formats and many of the cells for the spreadsheet (which can be downloaded from the HUD Office of Healthy Homes and Lead Hazard Control website at www.hud.gov/lea/fedshare.xls) are protected. There is no password for the protection.