

**THE RELATION OF LEAD-CONTAMINATED
HOUSE DUST AND BLOOD LEAD LEVELS
AMONG URBAN CHILDREN**

FINAL REPORT

Volume I

Protocols and Forms

Revised June 1995

**Departments of Pediatrics, Biostatistics, and Environmental Medicine,
The University of Rochester School of Medicine, Rochester, New York,
and the National Center for lead-Safe Housing, Columbia, Maryland**

U.S. Department of Housing and Urban Development Grant

#MLDP T0001-93

TABLE OF CONTENTS

PROTOCOLS

Dust Sampling Protocol	3
Handwipe Sampling Protocol	16
Soil Sampling Protocol	18
Water Sampling Protocol	20
Lead Paint Sampling Protocol	22
Blood Lead and Ferritin Requisition Protocol	27
Reliability Protocol	30

FORMS

Consent Form	32
Form 100	34
Form 200	43
Form 2 - Child Hand Wipe Sampling	59
Form 6 - Baseline Dwelling Characteristics	60
Form 7 - Soil Sample Plot Sketch - House with Yard	61
Form 8 - Soil Sampling	62
Form 9 - External Dust Sampling	63
Form 14 - Internal Dust Sampling	65
Form 10 - First Floor Dwelling Unit Floor Plan & Use	69

Form 11 - 2nd Floor 70
Form 12 - Basement 71
Form 13 - Extra Floor 72
Form 15 - XRF Calibration Check Data 73
Form 16 - XRF Measurements 74
Form 17 - Internal Dust Reliability Sample 76

INSTRUCTIONS

Water Sample Instructions to Families 79
Chain of Custody Record for Blood and Water Samples 80
Checklists 82

University of Rochester Lead-In-Dust Study

Dust Sampling Protocol

I. Purpose

This protocol provides for the measurement of levels of settled lead dust on a variety of surfaces to which children may be exposed. It is not intended to determine compliance with any existing regulations or to determine if dust cleanup is needed. In addition to quantifying the relationship between lead dust and blood lead in young children, this study will also examine which dust sampling methods provide biologically useful indicators of risk on different types of surface materials, including smooth vinyl, wood, high-pile carpet, low-pile carpet, and concrete. This protocol provides for side-by-side dust sampling using three methods. These methods include:

Wipe Sampling
Dust Vacuum Method (DVM)
Modified High Volume Small Surface Sampler (HVS-3)

II. Definitions

A. Window Sill

A window sill refers to the interior portion of the horizontal window ledge extending into the room (sometimes this is called the window stool).

B. Window Well

The window well refers to the horizontal surface that receives the window sash when it is lowered. The window well is usually located between the interior window sash and the storm window.

C. Principal Play Area(s)

The room where a child spends a significant amount of time playing, usually the room containing toys and/or the television. If the principal play area is also the child's bedroom, it shall be recorded as the principal play area.

D. Bedrooms

The bedroom is the room that the enrolled child uses for sleeping. If this bedroom is also the principal play area, a sibling's bedroom or the parent's bedroom shall be sampled.

E. Porch

A porch refers to any structure attached to a house that typically does not have heating and often has a separate foundation. Although a porch usually is not surrounded by walls, many structures that were originally porches have been enclosed. A porch may be the entryway; however, if the porch and primary entryway are distinct, then both should be measured. If there are more than two porches attached to one house, then the porch which is most often used to play on by the subject should be measured.

F. Pavement, Sidewalk, or Driveway

The pavement, sidewalk, or driveway refers to any concrete, asphalt, or cement surface in the yard of a family's house. Again, the area in which the subject spends the most time should be measured.

III. Number and Location of Measurements

A. Interior Dust Samples

A total of 33 dust samples will be collected from each dwelling from 11 locations. Three dust samples will be collected from each sampling location on a side-by-side basis. One blank sample for each sampling method shall be collected for every two housing units sampled.

B. Exterior Dust Samples

We will sample dust in 2 locations: the porch and a sidewalk, driveway, or pavement. A total of 5 samples shall be collected: 4 exterior dust samples using both vacuum methods and 1 sample using the wipe method.

Dust samples from the porch will be collected using the HVS-3, the DVM, and a wet-wipe. The midpoint of the largest area of the porch shall be selected for sampling unless there is a specific area on the porch where the child plays. In that case, the play area shall be sampled.

Similarly, the midpoint of any driveway, pavement, or sidewalk shall be sampled unless the child has a specific area on which he or she plays. Only the 2 vacuum methods will be used to collect dust from the pavement, driveway, or sidewalk.

C. Location of Samples

Samples shall be collected from floors, window sills, and window wells, with approximately one third of the samples coming from floors.

The environmental technician shall ensure that samples are collected from the child's principal play area. If there is more than one principal play area that is not included in the sampling locations shown below, deviations from the protocol are required, so long as the deviation is noted on the field sampling form. If there are two principal play areas, the second principal play area shall be sampled instead of the living room. Similarly, if the bedroom is also the principal play area, it shall be sampled as the play area (in this case, the bedroom of a sibling or parent shall be sampled as the bedroom).

The midpoint or largest open area in the room shall be selected for sampling, unless the child has a play area in the room. In that case, the play area shall be sampled. It is not necessary to sample the exact mid-point of each room. For example, if there is a table or other piece of furniture occupying the mid-point, move the sampling area so that it is located at the largest open area closest to the room mid-point. Do not sample under tables or furniture. Do not move furniture.

At a minimum, dust samples shall be collected from the following surfaces in the following rooms:

1. Floor at the most commonly used entryway
2. Kitchen floor
3. Kitchen window well
4. Kitchen window sill
5. Principal play area floor
6. Principal play area window sill
7. Principal play area window well
8. Living or dining room floor
9. Living or dining room window sill
10. Bedroom floor
11. Bedroom window sill
12. Bedroom window well

In short, five floors, three window wells, and four window sills will be sampled. The type of substrate will be recorded for each sample (i.e., vinyl, wood, high-pile carpet, low-pile carpet, concrete).

IV. Defining Exact Sampling Areas

A. Templates for Floors and Paved Surfaces

Templates measuring 1 foot by 1 foot shall be used to define the floor area to be sampled. A larger surface area may be required for some samples collected for this study to help ensure that sufficient quantities of dust are collected for analysis. The templates shall be made of non-metallic, smooth cleanable material, such as plexiglass or other plastic. Disposable templates made of cardboard may also be used.

All floor templates are to be taped to the floor to ensure that there is no movement during sampling.

All templates are to be cleaned using two wet wipes before each use, unless they are disposable.

All templates within a room must be positioned before any sampling begins. Sampling areas must not be walked on or touched before or during sampling.

B. Templates for Window Sills and Window Wells

Templates for window sills and window wells shall be constructed of masking tape. Each sill or well shall be divided into thirds of approximately equal size. Grooves and indentations at the two sides of the window sills and window wells will not be included in the sample. In other words, the perimeters of all sampling areas shall be rectangular and bounded by straight lines. It is not necessary for each sampling area for windows to be exactly the same size (i.e., it is not necessary that a window sill be divided into thirds exactly). However, it is necessary to measure each sampling area on a window surface exactly. Do not touch the surface to be sampled by the tape measure before sampling.

V. Location and Sequence of Side-By-Side Samples Within Each Sampling Location

A. Floor Types

The environmental technician will ensure that all floor sampling locations within each room are on the same type of surface (carpets, wood, tile, etc.). Do not mix different types of floors on the same sample (i.e., do not allow the sampling template to bridge two different surface types). Record the type of surface on the field sampling form.

B. Sequence

1. Sequence of each dust sampling method

For each sampling location, the environmental technician will conduct sampling in the

following sequence: First conduct the wipe sampling. Second, conduct the DVM sampling. Third, conduct the HVS-3 sampling. This sequence is necessary because the HVS-3 method may move dust from one area to another, due to possible release from the cyclone exhaust port.

C. Randomized Sampling Location for Each Method

1. The exact location of sampling methods with respect to each other (e.g., HVS-3, DVM and wipe) were determined by using lists of patterns generated in a random fashion. These were printed on adhesive labels and affixed to the environmental form.
2. Side-by-side sampling locations shall be in a straight line with respect to each other.
3. Each window or floor will be randomized rather than each individual house.
4. Using the random list of adhesive labels, the technician affixed labels to the sampling areas represented on the dust collection form.
5. It is especially important to randomly assign the sampling pattern for windows, since there may be differing levels of lead dust at the edges of the window sills and wells (the areas nearest the vertical window channels at each end) than at the center or midpoint. For purposes of this study, the two edge locations within each window sampling area are deemed to be equivalent with regard to randomization and analysis.

D. DVM Samples

In the event the DVM vacuum method does not obtain an adequate dust sample from a window sill, a second measurement will be obtained from a second comparable window sill in the same room, if available. However, all samples obtained from a second location will be identified as a distinct measurement for the purpose of statistical analysis.

VI. Equipment and Supplies for Dust Sampling

- A. Disposable wipes under the brand name "Little Ones Baby Wipes", available at K-Mart Stores. This specific brand is to be used because it is sufficiently durable under field use and recovery rates have been shown to be acceptable. Also, the spike samples used in this study will be manufactured using only this brand. Wipes are to be bought in a single large lot to reduce any influence of varying matrix materials or background lead content.

- B. Non-sterilized non-powdered disposable gloves. Disposable gloves are required to prevent cross-sample contamination from hands and deposition of hand oils on tared containers.
- C. Non-sterilized polyethylene centrifuge tubes (50 ml size) or other lead-free hard-shelled containers.
- D. Field sampling forms
- E. Templates
- F. Container labels with unique identifiers.
- G. Trash bags or other receptacles (do not use pockets or trash containers at the residence).
- H. Rack, bag, or box to carry sample containers (optional)
- I. Tape measure or ruler to measure window sill and well sample sizes, where standard-sized templates cannot be used.
- J. Sample pattern diagrams
- K. Clipboard and pen
- L. 37 mm filter cassettes with 0.8 pore size Mixed Cellulose Ester filters (for DVM)
- M. Constant flow personal air sampling pump (for DVM)
- N. Clean dust collection nozzle inlets (two types: one for DVM and the other for HVS-3)
- O. Modified HVS-3 cyclone dust sampler
- P. Dirt Devil vacuum cleaner (Model #103) with hose and shoulder strap
- Q. Stopwatch
- R. Disposable Dirt Devil Vacuum Bags (paper)
- S. Numbered and tared double-bagged microwave Teflon liners for HVS-3
- T. Extension cord
- U. Brand new Tygon tubing ($\frac{1}{4}$ " I.D.)
- V. Used Tygon tubing ($\frac{1}{4}$ " I.D.)

- W. Sixteen-inch long Tygon Tubing ($\frac{3}{4}$ " I.D.) for HVS-3 sampler
- X. Plastic baggies

VII. Wipe Sampling Procedure

A. Sample Area

Identify the template area to be wiped by referring to random sampling design.

B. Gloves

Don a new disposable glove on one hand; use a new glove for each sample collected. If two hands are necessary to handle the sample, use two new gloves.

C. Preliminary Inspection of Wipe Media

Only at the beginning of each house sampling visit remove the first wipe from the wipe dispenser and throw it away to minimize the potential for contamination from the lid of the container holding the wipes. Inspect the wipes to determine if they are moist. If they have dried out, do not use them. Only moist wipes are to be used.

D. Preparation of Sample Containers

Be sure that sample containers can be opened by partially unscrewing the cap. Do not use ziplock baggies to transport or temporarily hold wipe samples. Baggies cannot be rinsed quantitatively in the laboratory.

E. Initial Placement of Wipe

Remove the second wipe from the wipe dispenser (the first wipe has been discarded) with the gloved hand, shake open, and place it flat at one corner of the surface to be wiped.

F. First Wipe Pass

With the fingers together, grasp the wipe between the thumb and palm. If the surface is a square (e.g., a floor), proceed to wipe with as many "S" motions as necessary to cover the surface in a right

to left direction, pressing firmly but not excessively with the palm. (If the surface is not a square, see section 8 below.) Exerting excessive pressure on the wipe will cause it to curl. Exerting too little pressure will result in poor collection of dust. Do not use the fingertips to hold down the wipe, since this will result in incomplete contact with the surface being wiped. Attempt to remove all visible dust from the surface. Avoid touching the boundary tape, but be sure to wipe the entire surface. Do not touch any area beyond the boundary tape.

G. Second Wipe Pass

Fold the wipe in half with the contaminated side facing inward. Do not touch the contaminated side of the wipe with the gloved hand or fingers. Do not shake the wipe in an attempt to straighten it out, since dust may be lost during shaking. Repeat the wipe motion in a top to bottom direction, also in an "S" motion. Attempt to include all visible dust. Thus, two passes over the surface are to be completed, first in the right to left motion, second in the top to bottom motion.

H. Rectangular Areas (window sills and window wells)

If the surface is a rectangle (such as a window sill), two passes must be made over this surface, the first with the wipe entirely unfolded, and the second with the wipe folded so that the contaminated side faces inward. For a window sill or window well, do not attempt to wipe the irregular edges presented by the contour of the window channel. Avoid touching other portions of the window with the wipe. If there are paint chips or gross debris in the window well, attempt to include as much of it as possible on the wipe. If visible debris remains, do not repeat the sampling process and do not attempt to include the remaining debris in the sample.

I. Packaging the Wipe

After wiping, fold the wipe with the contaminated side facing inward again, and insert aseptically (without touching anything else) into the container.

J. Labelling the Wipe Container

Seal the container and record the laboratory submittal sample number on the field sampling form. Fill out the field sampling form completely.

VIII. Dust Vacuum Method (DVM) (Originally developed at the University of Cincinnati)

1. Calibrate the pump to operate at 2.5 liters/minute against a primary standard with a MCEF 0.8 μ filter in line. (This should be done before going out into the field each day.)
2. Assemble the sampling train: Attach a piece of 1/4" I.D. Tygon tubing to the pump. Attach the other end to the exhaust port of the air sampling cassette. Attach a brand new piece of 1/4" I.D. Tygon tubing measuring no more than 3/4" in length to the inlet of the cassette. The open end of the Tygon tubing should be cut at about a 45° angle.
3. Position the sampling template (all templates must be positioned in a room before any sampling begins). Do not walk on or touch any surface before or during sampling. Refer to the random sampling design to properly locate the DVM template.
4. Holding the filter cassette at about a 45° angle, vacuum the surface with contiguous, non-overlapping, left-to-right strokes by pressing the end of the tubing on the surface and drawing it across the sampling area in strokes lasting approximately 1.5 seconds. Strokes should be in one direction, not back and forth. Continue vacuuming until the entire surface has been covered.
5. Repeat the vacuuming process across the surface, but this time in a top-to-bottom motion.
6. Repeat the vacuuming process a third time, but this time returning to the left-to-right motion. For a 1-square-foot area, this whole process should take about 2 minutes. Three passes are to be made over the sampling area: Left to right, top to bottom, and left to right again.
7. Visually examine the interior of the filter cassette with the pump still running. If there is only a very small amount of loose material, select another adjacent floor surface that has not been touched and repeat the process using the same filter. (This repeated sampling on another adjacent surface does not apply to windows). In short, this process is intended to double the surface area sampled to ensure that an adequate quantity of dust has been collected. It is not unusual for this method to collect an insufficient quantity of dust for analysis. If a second area is required for sampling, it must be recorded on the field sampling form.
8. Remove the Tygon tubing from the cassette inlet (with the inlet pointed up), turn off the pump, and insert the plug. Remove the tubing connected to the pump and cassette and insert the exhaust plug.

IX. High Volume Small Surface Sampler (HVS-3)

- A. Clean and assemble the modified HVS-3 cyclone dust sampler (originally developed at the Kennedy-Krieger Institute in Baltimore):

1. Remove the clamp from the cyclone body and set aside the Teflon gasket.
2. Separate the two parts (cone and body) of the cyclone sampler.
3. Clean the inside surface of the cyclone and elbow with a clean wet wipe and discard the used wipe. Use a clean wet wipe for each section of the cyclone and a separate wipe for the rings and gaskets. Dry surfaces using a clean Kimwipe. Use the tongue depressor for pushing the wipe into hard-to-reach areas.
4. Reassemble the cyclone sampler and replace the Teflon gasket and clamp. Clean the gasket with a wet wipe before replacement.
5. Don a clean pair of powderless gloves in order to next handle the Teflon PFA liners. Do not handle the Teflon liners without wearing vinyl powderless gloves.
6. Remove a digestion Teflon PFA liner and cap from the ziplock bag.
7. Remove the cap from the Teflon PFA liner and place it in the ziplock bag. Attach the Teflon PFA liner to the cyclone sampler.
8. Retrieve a clean sampling nozzle from the container and attach it to the cyclone. (Secure it with tape.)
9. Attach the Dirt Devil vacuum cleaner hose to the cyclone body.
10. Run an extension cord from the nearest 120V outlet to the sampling location and plug in the Dirt Devil.

B. To test with the modified HVS-3 cyclone dust sampler:

1. Remove and discard (in waste bag) extraneous items such as broken glass, cigarette butts, insects, nails, tacks, etc. using the tweezers and scoop.
2. Turn on the power and start the stopwatch. Use overlapping passes (at least 50% overlap), first left-to-right and then front-to-back over the entire area designated for sampling. After one minute & 50 seconds stop sampling and let the vacuum run another 10 seconds and then turn off the power.
3. The sampler must be held vertically throughout the entire sampling process until removal of the PFA liner.
4. Carefully remove the Teflon PFA liner from the cyclone sampler and replace the cap

securely. Replace the Teflon PFA liner in the ziplock bag. Handle the PFA liner with gloved hands only.

5. Place the ziplock bag in the sample box.

C. Quality Assurance

1. A field blank sample is collected by going through the entire process of sampling without turning on the vacuum using an empty PFA liner.
2. The cyclone and elbows, rings, everything will be cleaned between samples.
3. The sampling nozzle will be changed between samples.
4. The Dirt Devil electric cord and the extension cord when used will be cleaned with Wash-A-Bye Baby wipes at the end of each day (every 2 home visits).
5. A disposable paper dust bag will be used inside the Dirt Devil cloth bag. This bag will be replaced at the end of each day.
6. The Dirt Devil vacuum will be cleaned at the end of each day, including the vacuum bag housing surfaces.
7. Visually examine the Teflon container. If there is no significant darkening of the bottom of the vessel (i.e., very little dust was collected), repeat the sampling on an adjacent surface of equal surface area using the same Teflon dust container. (This repeated sampling on an adjacent surface does not apply to windows.) In short, this process is intended to double the surface area sampled to ensure that an adequate quantity of dust has been collected. It is not unusual for this method to collect an insufficient quantity of dust for analysis. If a second area is required for sampling, it must be recorded on the field sampling form.

X. Area Measurement and Size

- A. Once sampling has been completed, it will be possible to measure the size of the surface areas sampled. If more than a one-square-foot area was required for either of the vacuum methods, the total surface area for each method must be recorded on the form.
- B. Measure the surface area sampled on windows for each method to the nearest eighth of an inch using the tape measure or a ruler. Record specific measurements for each area sampled for each method on the field sampling form. Standard-sized templates do not require measurement for each sample collected.

XI. Post-Dust Sampling Procedures

A. Trash Disposal

Remove the tape carefully from painted surfaces so that intact paint is not accidentally removed. If used, remove disposable template and throw it and the tape away in a trash bag only after all other dust sampling in the room has been completed. Remove the glove; put all used gloves and sampling debris used for the sampling period into a waste container or trash bag. This container or trash bag is not to be left in the housing unit. Do not throw away gloves, wipes, baggies, or any other material used during sampling inside the housing unit, where they could be accessible to young children, resulting in a choking hazard.

B. Inspector Decontamination

After sampling, wash hands thoroughly with plenty of soap and water before getting into car. A bathroom in the housing unit may be used for this purpose, with the resident's permission. If there is no running water in the dwelling unit, the wipes may be used to clean the hands. During sampling, inspectors must not eat, drink, smoke, or otherwise cause hand to mouth contact.

C. Resident Interaction

At the conclusion of all environmental sampling, thank the resident for participating and indicate that a report of the results will be mailed after laboratory analysis is complete.

XII. Quality Control/Quality Assurance

A. Blank Preparation

Obtain a blank sample for each method for each two houses sampled, and label with an identifier similar, but not identical to other identifiers and record it on the field sampling and laboratory submittal forms. Analysis of the blank determines if the collection media is contaminated. All results will be blank corrected. If a blank wipe sample contains more than 50 $\mu\text{g}/\text{wipe}$, the sampling results are invalid and cannot be blank corrected. Blank values will be reported with the sample results.

1. Blank wipes

Blank wipes are collected by removing the wipe from the container with a clean glove, shaking open, refolding, and then inserting it into the container without touching any other surface.

2. Blank filter cassettes

Blank filter cassettes are collected by removing the plugs briefly and then reinserting them. No air is drawn through the filter.

3. HVS-3 blank preparation

Remove a teflon container, open the cap and then close it. The blank is not connected to the cyclone. No air is drawn into the tube.

B. Spiked Media

Spiked samples will be blindly inserted into the sampling stream to determine if there are adequate recovery rates. Spiked media are prepared by delivering a known amount of lead dust to the wipe, DVM filter, or the Teflon container, using NIST Standard 1648 or 1579a. Spiked media for the HVS-3 and DVM methods will be analyzed for both total lead and lead concentration. All field spike results must be within 80 - 120% in order for the run to be considered valid. Field spike samples shall be inserted into the sample stream at a rate of 1 for each method for every 5 dwellings sampled.

C. Qualifications of Dust Samplers

1. All dust samplers must complete the EPA Lead Inspector course and any training course associated with this study.
2. All dust samplers must have a minimum of 3 years experience in environmental sampling.

University of Rochester Lead-In-Dust Study

Handwipe Sampling Protocol

I. Purpose

This protocol provides for the measurement of lead on the hands of children. Lead-contamination of children's hands has been correlated with blood lead levels. In this study, we will collect 2 handwipe samples from each child enrolled using K-Mart brand baby wipes. The 2 samples will be collected at the beginning and end of each home visit. The total quantity of lead is reported in ug lead/pair of composite samples.

II. Definitions

Each composite sample will consist of two wipes, one used to wipe the left hand and one used to wipe the right hand. The wipes from each hand are composited in a sealable container (for transport to the laboratory and labeled with the sample identification number).

III. Methods

- A. The person collecting the hand-lead sample will put on powderless, disposal gloves.
- B. The person collecting the sample will then wipe their gloved hands with a wet-wipe, which is then disposed.
- C. Each of the child's hands is sampled by thoroughly wiping it with one wet wipe. All surfaces of the hand, front and back, up to the wrists, are wiped thoroughly, using a circular motion. Each hand will be wiped for 1 minute. Hands that appear dirty should not be washed more vigorously than "clean" hands.

IV. Description of the Number and Timing of Handwipe Samples

- A. One composite sample will be obtained at the beginning of the home visit, before any handwashing is done.
- B. The duration of times since the child's hands were last washed will be documented.
- C. The 2 wet-wipes will then be placed in a resealable bag or other container which is labeled with the child's ID number and "first sample" handwipes.

- D. Following the first handwipe sample, the child's hands will be washed thoroughly, under direct observation of the interviewer.
- E. A second composite sample will be obtained at the end of the home visit or 2 hours after the child's hands are washed, whichever comes first.
- F. The second composite sample will be placed in a second resealable bag or other container which is marked with the child's ID number and "second handwipe".
- G. A field blank will be taken for each day sampling is carried out, an estimated 1 in 10 samples.
- H. The soil samples will be transported to Lozier Laboratories, 909 Culver Road, Rochester, New York 14609.

V. Equipment and Supplies

- A. The following equipment and supplies are needed to obtain composite soil samples:
 - 1. plastic sandwich-size sample bags (Zip-lock or equivalent);
 - 2. indelible marker;
 - 3. Disposable wipes; "Little Ones Baby Wipes" available at K-Mart stores.

University of Rochester Lead-In-Dust Study

Soil Sampling Protocol

I. Purpose

This protocol provides for the measurement of levels of lead in soil to which children may be exposed. Lead-contaminated soil may influence contamination of dust inside homes and in some studies has been correlated with children's blood lead levels. Measuring lead levels in soil is particularly important if the lead concentration is extremely high and for older children who frequently play in the dirt. In this study, we will collect composite surface soil samples using a coring device from each side of the dwelling with accessible soil and from selected play areas in the yard.

II. Number and Location of Measurements

At least one of two composite soil samples will be taken from the yard of each dwelling. One composite sample, which will be obtained at every property, will consist of 12 surface samples obtained with a coring device; 8 samples will be obtained one foot from the corner measured on a line parallel to the side and 4 samples will be obtained at the midpoint of the corner locations. Each sample will be taken two feet away from the foundation.

A second composite surface soil sample (aliquot) will be collected from bare areas in the yard where the child frequently plays. An appropriate total of ten surface specimens will be collected from the various sites identified. If one play area is identified, then all 10 aliquots will be collected in that area. If two areas are identified, then approximately 5 aliquots will be collected from each of the sites.

If the child plays frequently in a neighbor's yard, a sample should be obtained from that yard. Permission of the neighbor must be obtained prior to obtaining the sample.

III. Equipment and Supplies for Composite Soil Samples

- A. Plastic sandwich-size sample bags (Zip-lock or equivalent)
- B. Indelible marker
- C. Measuring tape
- D. Core sampling device - a 10 syringe cut-off at the distal tip
- E. 100 cc plastic container

IV. Sample Collection

- A. Composite soil samples shall be collected so that twelve different aliquots of surface soil are collected from bare areas along the building foundation. Each of the aliquots will be collected two feet away from the foundation of the house. A measuring tape will be used to determine the distance between the two corner sites and a aliquot will be collected at the midpoint. Thus a total of three aliquots will be taken from each side of the house; a total of 12. The plunger should be used to deliver the top 1/2 inch of soil from each aliquot to the container.
- B. A second composite sample will consist of approximately 10 aliquots collected in an X-shaped grid in the child's principal play area(s). The size of the grid will depend on the size of the play area, but ideally, each aliquot sampled should be at least 1-foot away from the previous sample. The plunger should be used to deliver the top 1/2 inch of soil from each aliquot to the container.
- C. Avoid adding grass, twigs, stones, and other debris to the sample.
- D. No specific effort should be made to include paint chips in the sample. However, they should not be avoided.
- E. Place the soil sample into the polyethylene bag and proceed to the next site.
- F. Label the sample bag with the sample identification number, seal the sample bag, and document the locations where the samples were collected on Form F.
- G. A composite will be identified as a single sample.
- H. Dispose of the sampling device.
- I. Duplicate samples will be taken at the frequency of 1 per 20 samples and will be collected from the midpoint of the center sample and one of the corner samples.
- J. A field blank will be taken for each day sampling is carried out, an estimated 1 in 10 samples.
- K. The soil samples will be transported to Lozier Laboratories, 909 Culver Road, Rochester, New York 14609.

University of Rochester Lead-In-Dust Study

Water Sampling Protocol

I. Purpose

This protocol provides for the measurement of levels of lead in water to which children may be exposed. We wish to obtain a tap water sample that will be predictive of the child's blood lead level. Since a standing water sample (i.e. water that has been standing in the pipes for at least 8 hours) is thought to represent the maximum level of lead in water, it will be necessary for the parent or guardian to take the water sample. In addition, a second sample will be obtained to determine the lead level of water after the initial flush.

II. Number and Location of Measurements

A total of two water samples will be taken from each dwelling in one location. Both water samples will be collected from the kitchen faucet. One sample will be collected immediately as the water faucet is turned on (first flush). The water will be left running and a second sample will be collected 1 minute after the first sample is obtained.

III. Equipment and Supplies

- A. Two each (1 liter) Nalgene water bottles with caps
- B. Labels with Name, LID study number, and time (in hours) since water was last used.

IV. Instructions to Families

- A. The tap water sample should be taken from the cold water faucet of the kitchen.
- B. The first water sample should be water that has been standing in the pipes for over 8 hours.
- C. The second sample should be obtained in a second bottle and collected 1-minute after the first sample is completed.
- D. There are two main options for the time a sample is taken: (1) it can be taken first thing in the

morning, or (2) if all of the residents of the household have been out of the house for the entire day it can be taken when they return.

- E. We will provide a labeled plastic bottle for each sample. Each bottle should be completely filled with the water. Each bottle contains a small amount of acid preservative and so it should be kept closed.
- F. Write the number of hours since the water was used on the label on one of the bottles.
- G. We will return to pick up the samples the following day at a time convenient for the family.
- H. Before dropping off a water collection bottle, the interviewer or clinical technician will fill out and affix the label provided by the laboratory.
- I. The chain of custody form will be initiated when the team member picks up the water sample.
- J. The water samples will be transported to Lozier Laboratories, 909 Culver Road, Rochester, New York 14609.

University of Rochester Lead-In-Dust Study

Lead Paint Sampling Protocol

I. Purpose

This protocol is intended to characterize lead concentrations in paint to which a resident child could be directly exposed. It is not intended to determine compliance with existing regulations or to determine which surfaces may require abatement. Other sampling methods will be used to determine exposures from other sources and pathways. Direct exposure to lead paint occurs through two principal mechanisms: ingestion of paint chips and mouthing or chewing of painted surfaces. Therefore, measurements will be taken only for defective paint, for surfaces that could release small paint chips (i.e., friction and impact surfaces), and for surfaces that are chewed or mouthed.

II. Location and Number of Measurements

A. Visual Inspection

A visual inspection of all interior and exterior painted surfaces in the dwelling shall be conducted to determine the location of surfaces with defective paint, including any painted interior or exterior furniture. The inspector shall note the presence of any teeth marks on any painted surface.

B. Residence Questioning

The resident shall be questioned to determine if any child in the dwelling is known to chew or mouth any painted surface or painted toy. The resident shall show the inspector the exact location where this behavior occurs.

C. Selection and Number of Surfaces

Based on the information gathered in sections A and B, the inspector shall select at least 10 but no more than 15 surfaces to test. The surfaces shall be those that are in the greatest state of deterioration and/or those that appear to be most accessible to the child. For each surface, the thickest part of the paint film shall be analyzed. Avoid testing paint films that are worn or show signs of having been scraped in earlier repainting efforts. At a minimum, the following surfaces should be tested, even if there are no defective, chewed or mouthed surfaces in the dwelling:

1. Exterior siding
2. Interior window sill stool (two locations)
3. Interior window sash (two locations)
4. Window well

5. Interior trim
6. Interior door (two locations)
7. Interior door jamb (two locations)
8. Exterior door
9. Exterior door jamb
10. Interior painted floor (or porch floor)

A window sill refers to the interior portion of the horizontal window ledge extending into the room (sometimes this is called the window stool).

The window well refers to the horizontal surface that receives the window sash when it is lowered. The window well is usually located between the interior window sash and the storm window.

III. Methods of Analysis

- A. Two methods of analysis are permissible: portable X-ray fluorescence analysis (XRF) and laboratory paint chip analysis by either atomic absorption or inductively-coupled plasma emission spectroscopy. Laboratory analysis shall be used only when XRF cannot be used due to an inaccessible surface, an ornate or severely-curved surface, or when there is too small a painted surface to measure. XRF readings will not be substrate corrected or confirmed by laboratory analysis for this project.
- B. Direct-reading XRF analyzers will be used and there will be at least 3 readings per spot tested.
- C. The use of wet chemical field test kits employing a colorimetric change as the indicator of the presence of lead (sodium sulfide and sodium rhodizonate) shall not be used.

IV. Qualifications of Paint Inspectors

- A. All inspectors shall be properly licensed in the State of New York to use the radioactive source contained in the XRF.
- B. All inspectors must have completed the manufacturer's training course in the use of the instrument, or be under the direct field supervision of an individual who has completed the course.
- C. All inspectors must complete the EPA Lead Inspector course.
- D. All paint inspectors must be under the direct field supervision of an individual who has a minimum of 3 years experience in paint testing.

V. Coding of Rooms and Sample Locations:

Draw a simple floor plan. Number all room consecutively from the basement up and in a clockwise direction facing into the house from the main entryway. A separate diagram will be needed for each floor. Also identify the principal play room (TV room, kitchen, living room, etc.) used by children under 6 years of age, and the bedrooms of all children under 6 years of age.

VI. Paint Condition Coding

- A. Visually inspect painted surfaces for signs of deterioration. The following definitions shall be used for paint condition for this project:

Good: The paint film appears intact and does not chalk, flake or peel. The hand should be passed over the surface. If a chalky substance is visible on the hands, the paint is in "poor" condition, even if it appears to be intact. Paint in good condition has very few places where the paint is cracking, blistering, or otherwise separating from the substrate. Some minor chipping around doors may be present. Less than 5% of the surface is deteriorated or defective.

Fair: The paint film is largely intact, but is cracked, worn or chipped (approximately 5% - 15% deteriorated).

Poor: More than 15% of the paint film is peeling, chalking, flaking, blistering, or otherwise separating from the substrate.

- B. Defective paint includes paint, varnish, stain, or other paint-like coating that is chipping, flaking, peeling, chalking, cracked, crazed, alligating, worn, or otherwise deteriorated.

VII. Paint Inspection Materials and Equipment

- A. Princeton Gamma Tech XK-III XRF Analyzer, Warrington Microlead I - Revision 4 XRF Analyzer, or Scitec MAP-3 XRF analyzer
- B. NIST Standard Reference Material 2579 Lead-Based Paint Film, Level 1 through 4 (plus blank)
- C. Disposable wipes for cleaning paint scraper (such as "Little Ones Baby Wipes," available at K-Mart Stores)
- D. Non-sterilized non-powdered disposable gloves
- E. Field sampling form

VIII. XRF Calibration and Instrument Check

- A. Prepare the instrument for operation the day before going out to the residence. Ensure that batteries are fully charged. Perform a calibration check the day before according to the following instructions. (If the instrument was used the previous day, this step is not necessary.)
- B. Follow the manufacturer's instructions for turning on the instrument, entering the correct date and other codes as needed, and checking the accuracy and precision of the manufacturer's calibration. Follow the recommended warm-up time. Follow radiation safety rules at all times, and never point the XRF instrument at anyone, whether it is in use or not. The XRF must be in the personal possession of the inspector at all times in the field.
- C. After determining which painted surfaces will be tested, select a similar reference substrate. For example, if the defective painted surfaces to be tested are wood and metal, select wood and metal reference substrates. Reference substrates for this project shall consist of metal plate (1/4" thick), drywall, wood, and brick. For the direct-readers (the Warrington and the Princeton Gamma Tech), take 3 readings on each of the selected reference substrates after they have been covered with the Level III National Institute of Standards and Technology (NIST) Standard 2579 (1.02 mg/cm²) standard.
- D. Repeat all zero checks and calibration checks after each dwelling unit has been tested and record the data.

IX. Record XRF Measurements

- A. Record each individual XRF reading. For the direct-readers, if the range of the three readings is greater than 1.7 mg/cm², take three additional readings. If the range of the second three readings is greater than 1.7 mg/cm², clear the instrument and take three additional readings. If this fails, use another XRF instrument and/or contact the manufacturer to determine the source of the problem.
- B. Quality Assurance/Quality Control Field Testing

Field Testing: Five percent of the surfaces tested by XRF under this project shall be tested a second time. The second test shall be under the direct observation of a project supervisor using the same instrument, if possible. The repeated measurements must not be more than ± 1 mg/cm² when compared to the first measurement. This relatively large margin of error is specified because it will not be possible to test the exact same spot the second time. The 5% of the surfaces to be measured shall be selected randomly by the project supervisor periodically throughout the duration of the project. The surfaces to be tested a second time will not be made known to the inspector before they are tested the first time. The results of the repeated testing shall be maintained in a project log notebook. If the repeated measurement is outside the acceptable range, the measurement shall be repeated a third time. If it is still outside the acceptable range, five other surfaces shall be tested.

If these results are satisfactory, no additional testing is required. If they are not, the housing unit must be retested in its entirety and another dwelling unit tested by that inspector with the same instrument shall be retested. If these results also prove unsatisfactory, further testing is required until acceptable results are produced. All inspectors working under this project must be informed of QA/QC requirements before inspections begin.

University of Rochester Lead-In-Dust Study

Blood Lead and Ferritin Requisition Protocol

IS THE CONSENT FORM SIGNED BY THE PARENT OR LEGAL GUARDIAN?

Complete and Initial Blood Lead and Ferritin Laboratory Requisitions
and Label Tubes Using Child's Subject Number Date and Time of Draw



Draw Blood Sample Using Venipuncture Technique



Blood Lead Level requires at least 3 ml in **Lavender** Top Tube



Blood Ferritin Level requires at least 3 ml in **Red** Top Tube



Invert Several Times To Ensure Proper Mixing



Blood Lead



Blood Ferritin



Initiate Chain Of Custody Document



Refrigerate Both Samples at 4°C Within 30 Minutes Of Collection
And Store At Same Temperature Until Shipment



Secure **Blood Lead Sample and Requisition** in Cardboard Container Provided By Wadsworth Laboratory
CLIN TECH: Retain Gold Copy of Requisition. Return it to LID Office.



Secure **Blood Ferritin Sample to Requisition** and place in Baggie



MONDAY AND WEDNESDAY

Mail **Blood Lead** to Wadsworth Center Lead Poisoning Laboratory
NYS Department of Health, Empire State Plaza, Albany, New York 12201-0509
Laboratory Evaluation Program (c/o Patrick Parson)

TUESDAY AND THURSDAY

COURIER: Deliver **Blood Ferritin** to U of R Specimen Receiving Lab.
Return Receipt to LID Study Office.

University of Rochester Lead-In-Dust Study
Blood Lead and Ferritin Requisition Protocol

Method:

Before leaving Lozier Lab please complete the blood lead and ferritin requisitions.

1. Make sure the consent form is signed.
2. Educate the patient according to their level of comprehension, with the parent present, about what it is like to have blood drawn.
3. Assure the patient and parent of minimal discomfort.
4. Inspect the patient's arms and hands for best venipuncture site.
5. Determine the best method of venipuncture for the patient (butterfly 18 ga. or conventional needle 21 ga. assembly).
6. Clean venipuncture site using Becton Dickinson (B-D) alcohol prep until alcohol prep shows clean. Let air dry or dry with clean gauze.
7. Interviewer will properly restrain the child by holding elbow area with one hand and wrist with the other hand. It is necessary to maintain a firm grip on both sites to prevent the arm from moving during a venipuncture.
8. Apply tourniquet.
9. Interviewer and Clin Tech II put gloves on now.
10. Palpate for vein.
11. Clean site again and dry after palpating.
12. Insert needle assembly.
13. Draw one 3 ml vacutainer lavender tube with EDTA preservative. Mix well; invert 3-5 times.
14. Draw one 3 ml vacutainer plain red top tube for serum ferritin. Mix well; invert 3-5 times.
15. Loosen tourniquet before last tube is full or before withdrawing needle.

16. Withdraw needle.
17. Apply pressure to venipuncture site until bleeding is stopped, then apply bandage.
18. Write in patient's name, other coded information, and sign label. Fix labels to tubes.
19. Protect the blood lead from light by wrapping the collection tube in aluminum foil immediately. Put tubes in cooler. Protect the blood lead tube from breakage by wrapping cotton in the inner metal can. Tape the lid of the outer cardboard can to insure against accidental opening during shipping. All waste materials should be **red-tagged**. Upon failure to achieve venipuncture, the alternative fingerstick procedure as described by CDC may be used.

Equipment and Supplies

1. Consent form
2. 22 ga. by 3/4", vacutainer multiple sample Luer-Adapter, Becton Dickinson vacutainer with EDTA preservative, and vacutainer holder
3. Becton Dickinson (B-D) alcohol swab
4. Tourniquet
5. Cooler with "Blue Ice" packs to keep sample cool

University of Rochester Lead-In-Dust Study

Reliability Protocol

I. Purpose

The purpose of reliability testing is to determine the variability of lead-contaminated house dust and its measurement. Our intent is to provide an estimate of the variability of measurements within the same environment and to measure the variation in collection efficiency among environmental technicians in a controlled laboratory setting.

II. Variation in Lead Levels Within a House

Variation in lead-contaminated house dust will be determined by repeat measurements of 10% of the sample population homes. Ten of the repeat samples will be done in the first two weeks of the study and the remainder will be done during the following 10 weeks. These homes will be selected from the entire sample population.

To assess the variation within the same home environment, for each home that is randomly selected to be repeated, a second environmental technician will be assigned to collect duplicate measurements. These duplicate samples will include 3 floor dust samples (principal play area, child's bedroom, and kitchen) and three window wells and sills in the principal play area, the child's bedroom, and the kitchen. If there is not a second window in any of these three sites, then a window in either the living room or dining room will be sampled. Finally, if there are no windows in any of the rooms already mentioned, then 2 windows in rooms that have not previously been measured will be designated.

III. Technician Reliability

To measure the reliability of dust-lead collection among environmental technicians, we will assess the recovery rate of a known quantity of lead-dust from various types of surfaces in a laboratory setting. Using linoleum, carpet, and wood flooring material, we will spike each surface with a known amount and concentration of urban particulate matter (NIST Standard Reference Material 1648). We used a modified ASTM Method 608-89 to compare the recovery effectiveness of lead-dust from carpets between technicians. Each technician will collect dust from three different surfaces (1 blank) using 3 different collecting devices, for a total number of 9 samples. This process will be repeated twice during the study period. These reliability assessments will allow us to measure any drift in collection techniques and to compare recovery rates between technicians.

A second measure of technician reliability will include the visual inspection of the interior and exterior of the house. For every house that has repeat dust sampling, the visual inspection will also be done by a second technician. The results of the first and repeat inspection will then be compared to determine the reliability of the visual inspection.

IV. Procedure

1. Homes will be chosen to have a repeat measurement by using a random list.
2. The LID Eligibility Coordinator will contact The Lozier Laboratory Director of QA to designate a house and assign a 2nd technician to the team.

V. Methods

1. The technicians will collect samples in the following order: wipe, DVM, and HVS-3.
2. Each of the floors in the principal play area, the bedroom, and the kitchen will be sampled alongside the first samples using separate templates.
3. It is important to place the templates so that both technicians can obtain their samples without disturbing the other area to be sampled. Thus, to minimize this problem, both templates should be placed simultaneously.
4. For each of the rooms where there is a second (or third) window that has not been already sampled, a repeat window sill and window well measurement will be obtained from 2 of the following rooms: principal play area, child's bedroom, kitchen, living room, or dining room. The sampling locations of the windows will be determined by the order of rooms listed above. Thus, the preference is to always sample a second window in the child's principal play area, when available.
5. If there are no additional windows in any of the rooms listed above, then windows in two additional rooms will be measured.

CHILD IDENTIFICATION NUMBER ___ - ___ - ___ - ___

CHILD'S ADDRESS _____

The Relation Of Lead-Dust And Blood Lead Levels Among Urban Children

Consent Form

I understand that I am being asked to participate in a study to find ways to prevent lead poisoning in children. I understand that I have been asked because my child is in the age group at greatest risk. Lead poisoning is considered by many experts to be one of the most significant public health problems in the United States today.

I understand that participation in this study will involve a temporary inconvenience. Program staff will need to come into my home on one occasion for about 2 or 3 hours, to obtain the samples described below and ask me questions.

I also understand that I will receive compensation from the study for my participation. This compensation will consist of two \$25 gift certificates for grocery items of my choice. One will be distributed after the home visit samples are completely collected. The second will be given upon receipt of the water samples the following day.

I also understand that this study may benefit my children because it will inform me of my child's blood lead test and methods of preventing lead poisoning. The study may also benefit other children because it may provide information on the amount and sources of lead in and around homes and help determine the best ways to prevent lead poisoning, a very serious child health problem.

I, as the legal guardian of the child participating in the study voluntarily agree to take part in the study and consent to having my child participate. I understand that my and my child's participation may involve:

- (1) being interviewed
- (2) contributing one sample of blood from my child
- (3) allowing soil, dust and water samples to be taken at my residence
- (4) allowing the examination of paint at my residence

I understand that a bruise can develop at the site of the venipuncture (where blood is drawn). I also understand that I can request to have my child's blood drawn by my child's pediatrician. However, I further understand that it is necessary to send the sample to the lab specified by the Lead Program staff.

I have been assured that personal information will be kept in confidence by the Lead-In-Dust Study Program. I also understand that neither I, nor any member of my family, will be identified by name in any reports of the results of the project.

I understand that I may decline to answer specific questions as I see fit and that I am free to withdraw my child's participation in the project at any time. I also understand that my withdrawal will not jeopardize receipt of medical care for myself or my child.

I understand that I will be informed, in writing, of the results of all of the blood, soil, dust, water and paint tests described above by the project staff in a timely fashion and that these results will be explained to me.

I understand that if any blood test results indicate that my child should receive medical follow-up, the project staff will provide a referral to my doctor or will assist me in finding a doctor.

I understand that if the test indicates a need for medical follow-up, I will be notified immediately. I request that my doctor release information from the medical chart about my child from the time of birth through December 31, 1994.

I can obtain additional information about this study, medical follow-up, and questions I may have about the results of the study by calling or writing Dr. Bruce Lanphear, the principal investigator, or Nancy Winter, the program director, at:

Lead Prevention Trial Program
Department of Pediatrics
Rochester General Hospital
1425 Portland Avenue
Rochester, NY 14621
(716) 338 - 7447
(716) 336 - 3928

I can also contact either St. Mary's Hospital, Strong Memorial Hospital, or Rochester General Hospital's patient representative to ask questions about my rights as a participant in the study.

Subject's Signature

Witness Signature

Name Printed

Name of Witness Printed

9/14/93

**LEAD IN DUST STUDY
ELIGIBILITY INTERVIEW FORM 100**

0. _____ (0001 - 7000)

CONSECUTIVE STUDY NUMBER

Introduction:

Hello, may I speak with _____
Print name of parent or legal guardian; phone #

If parent or guardian is there:

Hi, my name is _____. I work in the Department of Pediatrics at the University of Rochester. I am calling you today to talk with you about a study we are working on to learn more about levels of lead where children live and play.

I wonder if now is a good time to ask you a few questions? It should only take 5 minutes.

If YES,
OK, Great. [Continue]

If NO,
Ask when would be a good time to call back? See contact sheet.

If parent/guardian does not want to participate, ask why?

See Facts Sheet in order to see if you can gently encourage them to participate.

1. Collection date: 1. ____ / ____ / ____
month date year

I would like to ask a few questions about you and your child, <Child's Name>.

2. Child's Name: 2. _____
FIRST M.I. LAST NAME

3. What is <Child's Name>'s date of birth? 3. ____ / ____ / ____
month date year

Does child's birthday fall between ----->
If NO, child is ineligible. or ----->
or ----->

3/1/91 -- 9/30/92
4/1/91 -- 10/31/92
5/1/91 -- 11/30/92

----->
IF NO, GO TO #15

LEAD IN DUST STUDY
ELIGIBILITY INTERVIEW

4a. Has <Child's Name> lived at this street address since birth?

4a.
YES NO

4b. How long has <Child's Name> lived at the address where they are living?

4b. _____
months

INTERVIEWER, ASK YOURSELF:

4c. Has <Child's Name> lived at this same address since birth or six months of age?

4c.
YES NO
IF NO TO 4c, GO TO #15
----->

5a. What is <Child's Name>'s primary address:

number	street	Rd, St., Ave, Blvd, Alley or other
--------	--------	------------------------------------

5b. What is the zip code at <Child's Name>'s address?

5b. _____
zip code

6. How often does <Child's Name> take vitamins?
(If none, then code 00)

6. _____/week
days

7. Does <Child's Name> take an iron supplement that is prescribed by a physician?

7.
YES NO DK
IF YES, CHILD IS INELIGIBLE.
----->

GO TO #15

8a. Does <Child's Name> take prescription medication or a home remedy?

8a.
YES NO DK

8b. What is the medicine's name? _____
name of medicine

LEAD IN DUST STUDY
ELIGIBILITY INTERVIEW

9. Has <Child's Name> had oral medication or a shot, because of lead poisoning?

9.
YES **NO**
IF YES, CHILD IS
INELIGIBLE,
GO TO #15

----->

10. How many hours per week does <Child's Name> spend away from the home, including weekends? But, please do not count the time spent driving in a car or shopping.

10. _____
Exact # of hours/week

Probe: Does he/she go to DAYCARE
 GRANDPARENTS
 BABYSITTER
 OTHER

If > **20 hours each week,**
the child is ineligible.
GO TO #15

----->

11. In the past year, has any work been done on the home to reduce **LEAD LEVELS**?

11.
YES **NO** **DK**
If YES, child is ineligible.
GO TO #15

----->

12. Since <September/October/November> 1992, have you or anyone else done the following work on your home?
If YES, record the month and year.

	TYPE OF WORK	SINCE SEPT/OCT/NOV 1992			MONTH/YEAR
A	Sanding/scraping	YES	NO	*DK	/
B	Replaced windows (NOT storm windows)	YES	NO	*DK	/
C	Knocking down wall(s) or replacing ceiling(s)	YES	NO	*DK	/

- A. If > **one wall has been sanded** the child is ineligible.
- B. If > **two windows have been replaced** the child is ineligible.
- C. If **any wall or ceiling has been knocked down** the child is ineligible.

LEAD IN DUST STUDY
ELIGIBILITY INTERVIEW

*If DK, ask the following:

Is there anyone at home right now who might know? Could you ask them?
Can I call you back - can you call me back with the information?

Does this work make the child ineligible?

12d.
YES **NO**
IF YES, GO TO #15
----->

Now I am going to ask you about jobs and hobbies that you or any member of your household may have been involved in during the past year. These activities may involve exposure to lead. I want you to include anyone who was living there this past year even if they are not there now.

13. To the best of your knowledge, in the past year, from <September/October/November> 1992 through today, has anyone in the household been involved in activities from the list which I am now going to read to you?

Repeat, "In the past year....., or since last <September/October/November>". before each question.

ACTIVITIES	IN THE PAST YEAR...		
Battery manufacturing	YES	NO	DK
Sandblasting	YES	NO	DK
Window replacement	YES	NO	DK
Shooting guns indoors	YES	NO	DK
Lead factory work	YES	NO	DK
Deleading	YES	NO	DK
Scraping and painting (including painting pictures)	YES	NO	DK
Working with stained glass or leaded glass	YES	NO	DK
Making fishing sinkers, bullets or lead glazed pottery or anything else with lead	YES	NO	DK

Answering YES to ANY of these items makes the child ineligible.

*If DK is answered, probe to see if answers can be obtained. For example, ask about what the members of the household do professionally, ask about any hobbies, or ask about how they spend their free time. Then from these answers, probe further to see if anyone is involved in anything similar to the activities listed above.

LEAD IN DUST STUDY
ELIGIBILITY INTERVIEW

If respondent still does not know, then continue the interview, but set up a call back in 2 days to get the required DK information.

14. *Do any of these activities make the child ineligible?*

14.
YES **NO**
If YES, child is ineligible.
GO TO #15
----->

15. *Is child eligible for this study?*

15.
YES **NO**
If NO, child is ineligible.
GO TO #19
----->

Based on your responses, you are eligible to participate in this important study. Your involvement would require that a team of 3 people spend about 2 1/2 or 3 hours collecting some measurements of lead in and around your home and you would spend 30 minutes talking with our interviewer. <Child's Name> would receive a free lead blood level test drawn from the vein.

All visits are scheduled in advance, and confirmed 24 to 48 hours prior to the visit. A lead analysis of your home would also be completed with no charge to you. In addition, upon completion of your participation in the study, you would receive two \$25.00 gift certificates from WEGMAN'S grocery stores.

16a. Are you willing to participate in the LEAD IN DUST STUDY?

If more information is requested, begin to provide more details about the study. Refer to the Fact Sheet **OR** the following statement.

First we would like to schedule an appointment at your home at your convenience. An interviewer, an environmental technician, and a clinical technician will arrive for the appointment. ID Badges and clear study identification will be worn by all study staff. The interviewer will ask you a few more questions about <Child's Name> similar to those you have just answered, while the environmental technician takes samples from the soil around your house and your porch or steps. We are also interested in taking samples of your water and other areas where lead may be around your home. You need not do anything to get ready for us. It is actually better if you do not disturb your environment since the best way for us to measure lead in your house is to take undisturbed samples.

LEAD IN DUST STUDY
ELIGIBILITY INTERVIEW

So how does this sound to you? Would you like to participate?

16a.
 YES NO

If YES, and the child is eligible, skip to QUESTION 16e.

If NO, and the child is eligible, continue to QUESTION 16b.

16b. May I ask you why not?

16b.
 YES NO

If NO, thank respondent for their time, and end interview.

GO TO #19

----->

16c. Reason why parent/guardian is not willing to participate:

16c. _____

After listening to parent/guardian's reasons about not participating, refer to the LID Study fact sheet to put at ease any concerns about why they do not want to participate.

16d. *Is the parent/guardian now willing to participate in the LID study?*

16d.
 YES NO

IF NO, GO TO #19

----->

If YES: Next, I will ask you a question about your family income. The information is completely confidential and we will not release it to anyone.

16e. What was your total gross household income during 1992? Please include wages earned, social security, unemployment insurance benefits, child support and any other income you earned during 1992.

A. < \$15,500 _____

B. > \$15,500 - \$20,500 _____

C. \$20,500 _____

D. > \$20,500 _____

LEAD IN DUST STUDY
ELIGIBILITY INTERVIEW

17. May I have the name, address, and phone number of one other contact person who will know how to reach you one year from today?

First Name	M.I.	Last Name
Street Address		
City	State	Zip Code
Area Code	Telephone Number	

Relationship to parent/guardian: _____

LEAD IN DUST STUDY
ELIGIBILITY INTERVIEW

18a. By the way, are there any other children living in the home who are less than 5 years old and, given what you know, are also eligible for our study?

18a.
 YES NO

If there is **NOT** another child, go to schedule appointment, then

Go to #19

----->

18b. If there is another child, say Great, will [he/she] also be willing to participate in our home interview?

18b.
 YES NO

If NO, go to schedule appointment, then

Go to #19

----->

18c. What is the name, gender, and birthdate of the child(ren)?

Child 1: _____ Gender: M F Birthdate: ___ / ___ / ___
 Name

Child 2: _____ Gender: M F Birthdate: ___ / ___ / ___
 Name

Child 3: _____ Gender: M F Birthdate: ___ / ___ / ___
 Name

Ask the respondent to have the child(ren) also present during the home interview in order to take part in the study if the other child(ren) will participate.

LEAD IN DUST STUDY
ELIGIBILITY INTERVIEW

I am going to now tell you what takes place next. We are going to schedule an appointment in your home at your earliest convenience. We are trying to schedule all appointments during the day, but some weekday evenings and Saturday mornings are available. What is the most convenient time of day for you to meet with us? What is the best day of the week for us to come?

[Interviewer assigns date, day, and time.]

Time: _____ AM / PM	Day: M Tu W Th F Sa
Date: _____	

[Interviewer must restate date, day, and time to respondent to verify.]

Can I have another day and time that would work for you?

Time: _____ AM / PM	Day: M Tu W Th F Sa
Date: _____	

[Interviewer must restate date, day, and time to respondent to verify.]

We will call to confirm the appointment the day before.

THANK RESPONDENT

We would like to thank you for taking your valuable time to answer our questions. You have been most helpful, and your time is greatly appreciated.

19. Collected by: _____ 19. _ _ _

Comments: _____

LID Number: _____

LEAD IN DUST STUDY
HOME INTERVIEW FORM 200

Introduction:

Hi, my name is <Interviewer's Name>. I work in the Department of Pediatrics at the University of Rochester. We spoke with you or someone in your family about a study we are working on about lead levels where children live and play.

I'd like to introduce <Environmental Technician's Name>; he will be collecting soil, water and dust samples from around and in your home. I would also like to introduce <Clinical Technician's Name>, who is a certified practitioner in New York State. <Clinical Technician's Name> will give a free blood lead test to <Child's Name> today. Is <Child's Name> home?

This interview consists of three sections. The first is the family household interview. The second section is a child specific interview. The third is a guardian section. First I would like to ask you a few questions about your household and family.

INTERVIEWER: Remember, if there is another child who is 12 - 60 months of age in household, complete the Sibling Interview Form 201 for each additional child.

1. Collection date and start time: 1. ____ / ____ / ____ : ____ : ____ AM PM
month day year

2a. Respondent's name: _____
Last First

2b. What is respondent's gender? 2b. Male Female

3. What is your relation to <Child's Name>?

- 1 Parent
- 2 Stepparent
- 3 Grandparent
- 4 Guardian
- 5 Sibling
- 6 Other relative
- 7 Friend/Sitter
- 8 Other _____

3. ____

LEAD IN DUST STUDY
HOME INTERVIEW

4. In what month and year did <Child's Name> move to your current address?

4. ___ ___ ___
month year

**IF CHILD HAS MOVED SINCE
6 MONTHS OF AGE, STOP THE INTERVIEW**

5a. Has <Child's Name> ever received medical care for lead poisoning?

5a. **Yes** No

5b. Did <Child's Name> stay in the hospital overnight for this care?

5b. **Yes** No

**IF RESPONDENT ANSWERS
YES TO QUESTION 5A. OR
5B END INTERVIEW.**

6. How many children under 5 years of age live in your home?

6. ___

7. Do you own or rent your home or apartment?

7. Rent Own

8. To the best of your knowledge, was your home or apartment built before 1940?

8. Yes No DK

9. Since you have been living here, has anyone ever removed or sanded paint from the walls, ceilings, floors, or woodwork **inside** your home or apartment?

9. Yes No DK

10. What month and year was the last time this work was done? (9999 if unknown)

10. ___ ___ ___
month year

PROMPT: If respondent can not recall when renovations were made, then ask: "Were they done before February 1991?" Also ask, "Have renovations been made while <Child's Name> has lived at this address?"

11. Since you have been living here, has anyone ever removed or sanded paint from the walls, porch or woodwork **outside** your home or apartment?

11. Yes No DK

LEAD IN DUST STUDY
HOME INTERVIEW

12. What month and year was the last time this work was done?
(9999 if DK)

12.
month year

PROMPT: If respondent can not recall when such renovations like
scraping were made, then ask: "Were these renovations made before
February 1991?"

13. In the past year, August 1992 to today, did any of your
next-door neighbors remove or sand paint from the **outside**
of their house or apartment?

13. Yes No DK

14a. Do you cook or serve food with any pottery or ceramics that
might be handmade or have come from another country?

14a. Yes No DK

14b. Is any of your family's food stored in the original cans
after they are opened? (i.e. canned fruit juice, tomato sauce,
tuna fish, or spaghettios)

14b. Yes No DK

LEAD IN DUST STUDY
HOME INTERVIEW

15. Who, if anyone, smokes in the household?

Q 15	WHO SMOKES IN THE HOUSEHOLD?	SMOKES	DOESN'T SMOKE	DON'T KNOW
15A.	MOTHER			
15B.	FATHER			
15C.	GRANDMOTHER			
15D.	GRANDFATHER			
15E.	UNCLE			
15F.	AUNT			
15G.	OTHER RELATIVE			
15H.	SIBLING			
15I.	OTHER PERSON			
15J.	N/A			

16. How often do you sweep the floors in your home?

- 0 never
- 1 less than monthly
- 2 monthly
- 3 every 2 weeks
- 4 once or more each week
- 5 DK

16. ____

17. How often do you wet mop the floors in your home?

- 0 never
- 1 less than monthly
- 2 monthly
- 3 every 2 weeks
- 4 once or more each week
- 5 DK

17. ____

LEAD IN DUST STUDY
HOME INTERVIEW

18. How often do you use an electric vacuum to clean the floors or carpets in your home?

- 0 never (no electric vacuum)
- 1 less than monthly
- 2 monthly
- 3 every 2 weeks
- 4 once or more each week
- 5 DK

18. ____

19. How often do you clean the windowsills and window wells in your home?

- 0 never
- 1 less than monthly
- 2 monthly
- 3 every 2 weeks
- 4 once or more each week
- 5 DK

19. ____

20. Which hospital was <Child's Name> born in?
(Read all choices)

20. ____

- 1 Rochester General
- 2 Strong Memorial
- 3 Highland Hospital
- 4 St. Mary's Hospital
- 5 Genesee Hospital

21. How would you describe <Child's Name> racial or ethnic background?
(Read all choices)

- 1 African American
- 2 White
- 3 Puerto Rican/Hispanic
- 4 Asian
- 5 Native American
- 6 Other _____
- 9 Unknown

21. ____

LEAD IN DUST STUDY
HOME INTERVIEW

22. What kind of medical insurance coverage does <Child's Name> have?
(Read all choices)

- 1 Prepaid or Public Benefits
- 2 Prepaid HMO (Genesee Valley Group Health Association)
- 3 Prepaid IPA (Preferred Care, Monroe Plan, Blue Choice)
- 4 Blue Cross/Blue Shield
- 5 Major Medical
- 6 Other Private Health Insurance _____

22. ____

23. After <Child's Name> was born did he/she receive formula
or other food from the WIC (Women, Infants and Children) program?

23. Yes No DK

24. Where do you usually take <Child's Name> for routine visits,
or for check-ups or shots, when there is no illness or injury?

GIVE NAME OF PLACE OR DOCTOR

_____ place

_____ MD / RN / Other

Provider

25. Do you have any friends or family with a child who has had lead
poisoning?

25. Yes No DK

26. Do you worry about <Child's Name> being exposed to lead?

26. Yes No DK

27A. Has anybody talked with you about lead poisoning?

27A. Yes No DK

27B. If YES, who?

- 1 Doctor
- 2 Nurse
- 3 Family member
- 4 Friend
- 5 Other (describe) _____

27B. ____

LEAD IN DUST STUDY
HOME INTERVIEW

Now I'm going to ask you how <Child's Name> spent his/her time in the past few months. I want you to tell me, as best you can, about <Child's Name> activities in the past three months.

28. In the past three months, how much time did <Child's Name> spend away from home? (If Not Applicable, then code 00.)

A. In daycare:

28A. ___ /week ___ /day
days hours

B. In nursery:

28B. ___ /week ___ /day
days hours

C. At relatives:

28C. ___ /week ___ /day
days hours

D. At sitters:

28D. ___ /week ___ /day
days hours

E. Other (vacation, out-of-state relatives, camp, etc.):

28E. ___ /week ___ /day
days hours

29. In a typically sunny week this summer, how much time would <Child's Name> spend playing outdoors in your yard?

29. ___ /week ___ /day
days hours

30. During this typically sunny week, would <Child's Name> spend time in the following areas of your yard?

A. grass

30A. Yes No NA

B. concrete or asphalt

31B. Yes No NA

C. dirt or soil

30C. Yes No NA

D. sandbox

30D. Yes No NA

E. porch

30E. Yes No NA

F. other _____

30F. Yes No NA

LEAD IN DUST STUDY
HOME INTERVIEW

31. In the past three months, how often did <Child's Name> spend inside playing on the floor?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

31. ____

As you know, children often put things other than food in their mouth such as toys or fingers. It's very natural for them to do this and doesn't necessarily hurt them. Now I'm going to ask you some questions about things that the child may put in his/her mouth.

32. How often does <Child's Name> use a pacifier?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

32. ____

33. How often does <Child's Name> use a bottle?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

33. ____

34. How often does <Child's Name> suck his/her thumb or fingers?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

34. ____

LEAD IN DUST STUDY
HOME INTERVIEW

35. How often does <Child's Name> put his/her mouth or tongue on the windowsill or window well?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

35. ____

36. How often does <Child's Name> put paint chips in his/her mouth?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

36. ____

37. How often does <Child's Name> put dirt or sand in his/her mouth?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

37. ____

Very few children like to wash their hands and it is difficult to make them. There are no rules or guidelines about how many times a day a child's hands should be washed. I'm going to now ask you some questions about washing <Child's Name>'s hands.

38. How often are <Child's Name> hands washed before eating?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

38. ____

LEAD IN DUST STUDY
HOME INTERVIEW

39. How often are <Child's Name> hands washed after playing outside?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

39. ____

Now I'd like to ask you about <Child's Name> eating and drinking habits.

40A. How often does <Child's Name> drink plain tap water?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

40A. ____

40B. Average # of 8 oz. glasses per day:

40B. ____/day

41A. How often does <Child's Name> drink tap water
in flavored or mixed drinks or foods?
(Orange juice, Kool-aid, powdered food, drinks
or frozen juices)

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

41A. ____

41B. Average # of 8 oz. glasses per day:

41B. ____/day

42. Does <Child's Name> eat vegetables from your or a
neighbor's garden?

42. Yes No DK

LEAD IN DUST STUDY
HOME INTERVIEW

43. How often does <Child's Name> eat with his/her fingers?

- 0 never
- 1 rarely
- 2 sometimes
- 3 often
- 4 always
- 9 don't know

43. ____

44A. Was <Child's Name> breast fed?

44A. Yes No DK

44B. How many weeks or months did you <Mother> continue breast feeding?

44B. ____
months

I am going to now ask you a few questions about <Child's Name> medical care and health.

45. Has a doctor ever told you that <Child's Name) has asthma?

45. Yes No DK

46. Has a doctor ever told you that <Child's Name> had anemia or low blood iron?

46. Yes No DK

47. If YES to question 46:

What month and year was it?
(9999 if unknown)

47. ____
month year

48. Does <Child's Name> have any other medical problems that I have not mentioned?

48. Yes No DK

What are they: _____

LEAD IN DUST STUDY
HOME INTERVIEW

49A. Which adult spends the most time with <Child's Name>?

- 1 Parent
- 2 Stepparent
- 3 Grandparent
- 4 Guardian
- 5 Sibling
- 6 Other relative
- 7 Friend/Sitter
- 8 Other _____

49A. ____

49B. What is this adult's gender?

49B. male female

50. As children get older, they tend to need less supervision.
How many hours in an average day is <Child's Name>, while
awake, in the direct view of an adult?
(NOTE: DK is an option)

50. ____ /day
hours

51. At what age, in months please, did <Child's Name> begin to crawl?
(99 if don't know)

51. ____
months

If there are more LID children in the household say, "Now I'm going to ask you the same questions about (the next child)." If there are no more questions say, "Now I am going to ask you a few questions about <Child's Name> parent(s) or legal guardian(s).

52a. Guardian's name:

_____ Last

_____ First

52b. What is guardian's gender?

52b. Male Female

53. What is guardian's age?

53. ____
years

LEAD IN DUST STUDY
HOME INTERVIEW

54. What is guardian's relation to child?

- 1 Parent
- 2 Stepparent
- 3 Grandparent
- 4 Other relative
- 5 Sibling
- 6 Not a relative
- 7 Other _____

54. ____

55. What was the last year of school you completed?

- 1 00-08 Grammar school
- 2 09-12 High school
- 3 13-16 College
- 4 17+ Grad school

55. ____

56A. In what area are you employed?

- A. 01 Homemaker
- 02 Laborer
- 03 Clerical
- 04 Craftsman or artist
- 05 Technical
- 06 Professional
- 07 Student
- 08 Farmer
- 09 Self-employed
- 10 Disabled
- 11 Unemployed
- 12 Other _____

56A. ____

56B. Is this employment full or part time?

- 1 Full-time
- 2 Part-time

56B. ____

LEAD IN DUST STUDY
HOME INTERVIEW

57. What is your marital status?

- 1 single
- 2 single, living together
- 3 married
- 4 separated
- 5 divorced
- 6 widowed

57. ____

LEAD IN DUST STUDY
HOME INTERVIEW

INTERVIEWER: Ask questions 58 - 61 for each child living in the household. Record the information in the table below.

58. What are the names of children 18 years or younger who live in your home?

59. What are the dates of birth of each of these children?

60. How many month's has <Child's Name> lived at the present address?

61. During the past year, how often did <Child's Name> go to the dentist?

- 0 never
- 1 one time
- 2 two times
- 3 two or more times
- 4 only go every 2 to 5 years
- 5 only go when there is a problem

62. In the past year, how many cavities did <Child's Name> have?

- 0 none
- 1 one
- 2 two
- 3 three
- 4 more than three a year

63. Do any of the children use mouth rinse with fluoride in it? (i.e., ACT, FLUORIGARD)

- 1 yes
- 2 no
- 9 DK

Q58	NAME OF CHILD Q 58	DOB Q 59	MONTHS LIVING IN PRESENT ADDRESS Q 60	# YEARLY DENTAL VISITS Q 61	YEARLY AVERAGE # OF CAVITIES Q 62	USES FLUORIDE MOUTH WASH? Q 63
a	f l	___/___/___				
b	f l	___/___/___				
c	f l	___/___/___				
d	f l	___/___/___				
e	f l	___/___/___				

LEAD IN DUST STUDY
HOME INTERVIEW

If there are no more children say, "This completes the interview. Thank you very much for your cooperation and time. We really appreciate your help."

64. Collection end time:

58. ___ : ___ AM PM
hour minute

65. Collected by:

59. ___

66. The quality of this interview is:

60. ___

1 reliable

2 some doubt

3 unreliable, explain _____

University of Rochester Lead-In-Dust Study
FORM 2 - Child Hand Wipe Sampling

Street Address	Zip Code	Child's ID
	146	

Pre-Interview Hand Wipes				
Sample No.	Time Child Last Washed Hands	Time of Sample	Time Since Child Last Washed Hands	Results Lead Conc $\mu\text{g}/\text{Wipe}$
			_____ min	

Post-Interview Hand Wipes				
Sample No.	Time Child Last Washed Hands	Time of Sample	Time Since Child Last Washed Hands	Results Lead Conc $\mu\text{g}/\text{Wipe}$
			_____ min	

University of Rochester Lead In Dust Study
FORM 6 - Baseline Dwelling Characteristics

Street Address	Zip Code	Child's ID
	146	

1. Year that dwelling was constructed _____

Code: 1 = After 1977, 2 = 1970-1977, 3 = 1960-1969,
4 = 1950-1959, 5 = 1940-1949, 6 = 1930-1939
7 = 1920-1929, 8 = 1910-1919, 9 = Pre 1910

Year _____

Specify source of year of construction _____

Code: 1 = Public Record, 2 = Realtor, 3 = Owner,
4 = Other (specify) _____

2. Estimated value of dwelling \$ _____

Specify source of estimated value _____

Code: 1 = Public Record, 2 = Realtor, 3 = Owner,
4 = Other (specify) _____

3. Obvious point sources

Potential lead point sources near residence including bridge repainting, repainting, and/or rehab of nearby buildings, abrasive blasting (both contained and uncontained), radiator shops, battery plants, secondary smelters, etc.

Point sources must be no farther than 4 blocks or 1500 ft. away to be included here.

Observed Point Source Code: 1 = Yes, 2 = No _____

If Yes, specify: _____

Interior Dwelling Unit Obvious Deterioration

Code: 1 = Yes, 2 = No, 3 = Not Applicable

11. Walls, ceilings, doors, and trim: _____

Obvious cracks in the plaster requiring extensive patching, more than routine patching, missing trim, or doors requiring major repairs or replacement.

Obvious building deterioration:

(check all sides of building before assigning condition):

Code: 1 = Yes, 2 = No, 3 = Not applicable

4. Roof, gutters, downspouts: _____

Roof missing parts of weathering surfaces or has holes or cracks. Gutters or downspouts broken.

5. Chimney: _____

Masonry cracked, bricks coming loose or missing; obviously out of plumb and not stable.

6. Walls and Siding: _____

Obvious large cracks or holes in masonry requiring extensive patching, more than routine painting. Siding has boards or shingles broken or missing. Obviously out of plumb or with bulges and not stable.

7. Windows and doors: _____

Two or more windows or doors broken, missing, or boarded up.

8. Porch or steps: _____

Major elements broken, missing, or out of plumb.

9. Foundation: _____

Foundation has major, visible cracks, missing material. Structure leans or is visibly unsound.

10. Paint chips present on foundation soil. _____

12. Floors: _____

Loose, missing, or cracked floor surfaces; finish is worn.

13. Heating/cooling and plumbing: _____

Obvious need for extensive repair of water damage.

University of Rochester Lead In Dust Study
FORM 7 - Soil Sample Plot Sketch
House with Yard

Street Address	Zip Code	Child's ID
	146	

Symbols: P = Paint Sample, X = Perimeter Sample, A1 = Play Area, A2 = Play Area

Approximate square feet of living space: _____ feet

Drawn By	Date

House with Yard

Road / Street in front of residence

University of Rochester Lead In Dust Study
FORM 8 - Soil Sampling

Street Address	Zip Code	Child's ID
	146	

Sample Type	Location	# Cores Collected	Surface Cover	Visible Paint Chips	Sample No.	Results Lead Conc ppm
Perimeter						
Perimeter						
Perimeter						
Perimeter						
Play Area						
Play Area						
QC	Enter QC Identifier Hrs:					

Number Cores Collected: Each Sample to be a Composite of 10 cores

Surface Cover Codes: 1 = No Bare, 2 = Small Amount Bare, 3 = Half Bare,
 4 = Mostly Bare, 5 = All Bare

Visible Paint Chips Code: 1 = Yes, 2 = No

Custody Transfer From	
Custody Transfer To	
Date	

Soil Status: _____
 Check Box If No Visible Soil _____

Samples Collected By (Print Name): _____

Initials	Date Collected

Reviewed For Data Center By (Print Name): _____

University of Rochester Lead In Dust Study
FORM 9 - External Dust Sampling

Street Address	Zip Code	Child's ID
	146	

Sample	Loc	Sur- face Type	Cond	Sample Size (in x in)	Wipe Sample No.	DVM Sample No.	HVS-3 Sample No.	Sample Pattern
Porch								
Drive								
Sidewalk								

Room Number from floor plan sketch

Location: A side = street side reference, B, C, D, sides identified in clockwise direction

Surface Type: 1 = Wood, 2 = Concrete, 3 = Low Carpet, 4 = High Carpet, 5 = Vinyl, 6 = Other

Condition: 1 = Poor, 2 = Average, 3 = Good

Middle Sample: 1 = Wipe, 2 = DVM, 3 = HVS-3 (determined by random sampling design)

If an additional area is required for vacuum sampling, record measurements for both areas.

Sample	Loc	Sur- face Type	Cond	Sample Size (in x in)	Wipe Sample No.	DVM Sample No.	HVS-3 Sample No.	Sample Pattern
Field Blank (if req'd for this dwelling unit)								

Technician	
Technician	

Wipe Lot No. _____
 DVM Pump Mfg & Serial No. _____
 DVM Pre-Cal Flowrate (L/min) _____
 DVM Post-Cal Flowrate (L/min) _____
 Date Samples Collected _____
 Date Shipped to Lab _____
 Shipped by _____

HVS-3 Serial No. _____
 HVS-3 Pre-Cal Flowrate _____
 HVS-3 Post-Cal Flowrate _____
 Collected by _____
 Date Received by Lab _____
 Received by _____

Room Number from floor plan sketch _____
 Location: A side = street side reference, B, C, D, sides identified in clockwise direction
 Surface Type: 1 = Wood, 2 = Concrete, 3 = Low Carpet, 4 = High Carpet, 5 = Vinyl, 6 = Other
 Condition: 1 = Poor, 2 = Average, 3 = Good
 Middle Sample: 1 = Wipe, 2 = DVM, 3 = HVS-3 (determined by random sampling design)
 If an additional area is required for vacuum sampling, record measurements for both areas.

University of Rochester Lead In Dust Study
FORM 14 - Internal Dust Sampling

Street Address	Zip Code	Child's ID
	146	

Rm. No	Sample	Loc	Surface Type	Cond	Sample Size (in x in)	Wipe Sample No.	DVM Sample No.	HVS-3 Sample No.	Sample Pattern
	Entryway Floor								
	Kitchen Floor								
	Kitchen Window Well								

Room Number from floor plan sketch

Location: A side = street side reference, B, C, D, sides identified in clockwise direction

Surface Type: 1 = Wood, 2 = Concrete, 3 = Low Carpet, 4 = High Carpet, 5 = Vinyl, 6 = Other

Condition: 1 = Poor, 2 = Average, 3 = Good

Middle Sample: 1 = Wipe, 2 = DVM, 3 = HVS-3 (determined by random sampling design)

If an additional area is required for vacuum sampling, record measurements for both areas.

Rm. No	Sample	Loc	Surface Type	Cond	Sample Size (in x in)	Wipe Sample No.	DVM Sample No.	HVS-3 Sample No.	Sample Pattern
	Principal Play Area Floor								
	Principal Play Area Windowsill								
	Principal Play Area Window Well								
	Living Room Floor								

Room Number from floor plan sketch

Location: A side = street side reference, B, C, D, sides identified in clockwise direction

Surface Type: 1 = Wood, 2 = Concrete, 3 = Low Carpet, 4 = High Carpet, 5 = Vinyl, 6 = Other

Condition: 1 = Poor, 2 = Average, 3 = Good

Middle Sample: 1 = Wipe, 2 = DVM, 3 = HVS-3 (determined by random sampling design)

If an additional area is required for vacuum sampling, record measurements for both areas.

Rm. No	Sample	Loc	Surface Type	Cond	Sample Size (in x in)	Wipe Sample No.	DVM Sample No.	HVS-3 Sample No.	Sample Pattern
	Living Room Windowsill								
	Bedroom Floor								
	Bedroom Windowsill								
	Bedroom Window Well								

Room Number from floor plan sketch

Location: A side = street side reference, B, C, D, sides identified in clockwise direction

Surface Type: 1 = Wood, 2 = Concrete, 3 = Low Carpet, 4 = High Carpet, 5 = Vinyl, 6 = Other

Condition: 1 = Poor, 2 = Average, 3 = Good

Middle Sample: 1 = Wipe, 2 = DVM, 3 = HVS-3 (determined by random sampling design)

If an additional area is required for vacuum sampling, record measurements for both areas.

Rm. No	Sample	Loc	Surface Type	Cond	Sample Size (in x in)	Wipe Sample No.	DVM Sample No.	HVS-3 Sample No.	Sample Pattern
	Field Blank (if req'd for this dwelling unit)								

Technician	
Technician	

Wipe Lot No. _____
 DVM Pump Mfg & Serial No. _____
 DVM Pre-Cal Flowrate (L/min) _____
 DVM Post-Cal Flowrate (L/min) _____
 Date Samples Collected _____
 Date Shipped to Lab _____
 Shipped by _____

Room Number from floor plan sketch
 Location: A side = street side reference, B, C, D, sides identified in clockwise direction
 Surface Type: 1 = Wood, 2 = Concrete, 3 = Low Carpet, 4 = High Carpet, 5 = Vinyl, 6 = Other
 Condition: 1 = Poor, 2 = Average, 3 = Good
 Middle Sample: 1 = Wipe, 2 = DVM, 3 = HVS-3 (determined by random sampling design)
 If an additional area is required for vacuum sampling, record measurements for both areas.

University of Rochester Lead In Dust Study
FORM 10 - FIRST FLOOR Dwelling Unit Floor Plan & Use

Street Address	Zip Code	Child's ID
	146	

Drawn By	Date

Symbols: B = Bath, BR = Bedroom, D = Dining Room, FR = Family Room, K = Kitchen, LR = Living Room, P = Porch, S = Stairs, C1 = C1 Child, C2 = C2 Child, etc.

<p>1. Approximate square feet of living space: _____ <div style="text-align: right; margin-left: 150px;">sq ft</div></p>	<p>3. Which is/are the child(ren)'s bedrooms? (Note: Ask only for Children > 6 months and < 6 years.) _____</p>
<p>2. Which room do(es) (name of child or children) play in most? _____</p> <p>Enter Room Number: _____</p>	<p>Enter room number(s): _____</p> <p>Note: Inspector should enter child identifiers on bedroom floor plan.</p>
FIRST FLOOR	
Road / Street in front of residence _____ _____	

Note: Sketch a separate plan for each floor of the dwelling beginning with the Basement, labeled as Room 1. Each floor and room is to be numbered and labeled from the ground up, and front to back. Stairs are numbered as rooms, closets and windows are lettered. On the first floor (of single family housing) sketch, number exterior walls to identify where paint measurement is made. For multifamily houses, make separate sketch for exterior of house.

University of Rochester Lead In Dust Study
FORM 11 - SECOND FLOOR Dwelling Unit Floor Plan & Use

Street Address	Zip Code	Child's ID
	146	

Drawn By	Date

Symbols: B = Bath, BR = Bedroom, D = Dining Room, FR = Family Room, K = Kitchen, LR = Living Room, P = Porch, S = Stairs, C1 = C1 Child, C2 = C2 Child, etc.

<p>1. Approximate square feet of living space: _____ _____ sq ft</p> <p>2. Which room do(es) (name of child or children) play in most? _____</p> <p>Enter Room Number: _____</p>	<p>3. Which is/are the child(ren)'s bedrooms? (Note: Ask only for Children > 6 months and < 6 years.) _____</p> <p>Enter room number(s): _____</p> <p>Note: Inspector should enter child identifiers on bedroom floor plan.</p>
SECOND FLOOR	
Road / Street in front of residence	

Note: Sketch a separate plan for each floor of the dwelling beginning with the Basement, labeled as Room 1. Each floor and room is to be numbered and labeled from the ground up, and front to back. Stairs are numbered as rooms, closets and windows are lettered. On the first floor (of single family housing) sketch, number exterior walls to identify where paint measurement is made. For multifamily houses, make separate sketch for exterior of house.

University of Rochester Lead In Dust Study
FORM 12 - BASEMENT Dwelling Unit Floor Plan & Use

Street Address	Zip Code	Child's ID
	146	

Drawn By	Date

Symbols: B = Bath, BR = Bedroom, D = Dining Room, FR = Family Room, K = Kitchen, LR = Living Room, P = Porch, S = Stairs, C1 = C1 Child, C2 = C2 Child, etc.

<p>1. Approximate square feet of living space: _____ <div style="text-align: right; margin-left: 150px;">sq ft</div></p> <p>2. Which room do(es) (name of child or children) play in most? _____</p> <p>Enter Room Number: _____</p>	<p>3. Which is/are the child(ren)'s bedrooms? (Note: Ask only for Children > 6 months and < 6 years.) _____</p> <p>Enter room number(s): _____</p> <p>Note: Inspector should enter child identifiers on bedroom floor plan.</p>
BASEMENT FLOOR	
Road / Street in front of residence	

Note: Sketch a separate plan for each floor of the dwelling beginning with the Basement, labeled as Room 1. Each floor and room is to be numbered and labeled from the ground up, and front to back. Stairs are numbered as rooms, closets and windows are lettered. On the first floor (of single family housing) sketch, number exterior walls to identify where paint measurement is made. For multifamily houses, make separate sketch for exterior of house.

University of Rochester Lead In Dust Study
FORM 13 - **EXTRA FLOOR** Dwelling Unit Floor Plan & Use

Street Address	Zip Code	Child's ID
	146	

Drawn By	Date

Symbols: B = Bath, BR = Bedroom, D = Dining Room, FR = Family Room, K = Kitchen, LR = Living Room, P = Porch, S = Stairs, C1 = C1 Child, C2 = C2 Child, etc.

<p>1. Approximate square feet of living space: _____ <div style="text-align: right; margin-left: 150px;">sq ft</div></p> <p>2. Which room do(es) (name of child or children) play in most? _____</p> <p>Enter Room Number: _____</p>	<p>3. Which is/are the child(ren)'s bedrooms? (Note: Ask only for Children > 6 months and <6 years.) _____</p> <p>Enter room number(s): _____</p> <p>Note: Inspector should enter child identifiers on bedroom floor plan.</p>
EXTRA FLOOR	
Road / Street in front of residence _____ _____	

Note: Sketch a separate plan for each floor of the dwelling beginning with the Basement, labeled as Room 1. Each floor and room is to be numbered and labeled from the ground up, and front to back. Stairs are numbered as rooms, closets and windows are lettered. On the first floor (of single family housing) sketch, number exterior walls to identify where paint measurement is made. For multifamily houses, make separate sketch for exterior of house.

University of Rochester Lead In Dust Study
FORM 15 - XRF Calibration Check Data

Street Address	Zip Code	Child's ID
	146	

Note: Do NOT rest instrument on floor to calibrate. Calibrate substrates that are in the dwelling.

Substrate Tested	NIST Standard Over Substrate?	OK?	ALC/SEL mg/sq cm Rdg #1	ALC/SEL mg/sq cm Rdg #2	ALC/SEL mg/sq cm Rdg #3	ALC/SEL mg/sq cm Avg
Pre-testing Calibration Check						
Standard: Wood	None					
Standard: Wood	Level III, Std 2579					
Standard: Brick	None					
Standard: Brick	Level III, Std 2579					
Standard: Steel	None					
Standard: Steel	Level III, Std 2579					
Post-testing Calibration Check						
Standard: Wood	None					
Standard: Wood	Level III, Std 2579					
Standard: Brick	None					
Standard: Brick	Level III, Std 2579					
Standard: Steel	None					
Standard: Steel	Level III, Std 2579					
Manufacturer's Pre-calibration (Optional)						

1. Type of measurement: _____
Code: 1 = Initial, 2 = QC

2. Exterior temperature at time of XRF testing: _____

3. XRF instrument used: _____
Code: 1 = PGT, 2 = Scitec, 3 = Warrington

4. XRF Model: _____ 5. XRF Serial No. _____

Information collected by (print name): _____

Initials	Date Collected

University of Rochester Lead In Dust Study
FORM 16: XRF Measurements

Street Address	Zip Code	Child's ID
	146	

QA / QC Dwelling? <input type="checkbox"/> Yes
--

Rm No.	Surface	Loca-tion	Sub-strate	Paint Cond'n	Teeth Marks	ALC	ALC	ALC	Avg
	Exterior Siding/Masonry								
ENTRYWAY									
	Exterior Door								
	Exterior Door Jamb								
LIVING ROOM									
	First Interior Door								
	First Interior Door Jamb								
KITCHEN									
	2nd Interior Door								
	2nd Interior Door Jamb								
PRINCIPAL PLAY AREA									
	First Windowsill								
	First Window Well								
	First Window Sash								
BEDROOM									
	2nd Windowsill								
	2nd Window Well								
	2nd Window Sash								

Rm No.	Surface	Location	Substrate	Paint Cond'n	Teeth Marks	ALC	ALC	ALC	Avg
	Painted Interior Floor								
	Painted Porch Floor								
	Furniture _____								
	Furniture _____								
	Playground Equip _____								
	Other _____								
	Other _____								
	Other _____								
	Other _____								

Room Number from floor plan sketch

Location: (Walls) A side = street side reference; B, C, D, sides identified in clockwise direction from A side;

(Components) Similar building components on the same wall are numbered in a clockwise direction

Substrate: 1 = Wood, 2 = Masonry, 3 = Steel, 4 = Brick, 5 = Dry Wall, 6 = Plaster, 7 = Other

Condition: 1 = Poor, 2 = Average, 3 = Good

Visible Teeth Marks Present: 1 = Yes, 2 = No

ALC = Apparent Lead Concentration (minimum three readings per spot for direct readers).

University of Rochester Lead In Dust Study
FORM 17 Internal Dust Reliability Sampling

Street Address	Zip Code	Child's ID
	146	

Rm. No	Sample	Loc	Surface Type	Cond	Sample Size (in x in)	Wipe Sample No.	DVM Sample No.	HVS-3 Sample No.	Sample Pattern
	Kitchen Floor								
	Principal Play Area Floor								
	Child's Bedroom Floor								

Room Number from floor plan sketch

Location: A side = street side reference, B, C, D, sides identified in clockwise direction

Surface Type: 1 = Wood, 2 = Concrete, 3 = Low Carpet, 4 = High Carpet, 5 = Vinyl, 6 = Other

Condition: 1 = Poor, 2 = Average, 3 = Good

Middle Sample: 1 = Wipe, 2 = DVM, 3 = HVS-3 (determined by random sampling design)

If an additional area is required for vacuum sampling, record measurements for both areas.

Rm. No	Sample	Loc	Surface Type	Cond	Sample Size (in x in)	Wipe Sample No.	DVM Sample No.	HVS-3 Sample No.	Sample Pattern
	#1 Window Well Location: _____								
	#1 Windowsill location: _____								
	#2 Window Well location _____								
	#2 Windowsill location: _____								
	Field Blank (if req'd for this dwelling unit)								

Room Number from floor plan sketch

Location: A side = street side reference, B, C, D, sides identified in clockwise direction

Surface Type: 1 = Wood, 2 = Concrete, 3 = Low Carpet, 4 = High Carpet, 5 = Vinyl, 6 = Other

Condition: 1 = Poor, 2 = Average, 3 = Good

Middle Sample: 1 = Wipe, 2 = DVM, 3 = HVS-3 (determined by random sampling design)

If an additional area is required for vacuum sampling, record measurements for both areas.

Technician	
Technician	

Wipe Lot No. _____

DVM Pump Mfg & Serial No. _____

DVM Pre-Cal Flowrate (L/min) _____

DVM Post-Cal Flowrate (L/min) _____

Date Samples Collected _____

Date Shipped to Lab _____

Shipped by _____

HVS-3 Serial No. _____

HVS-3 Pre-Cal Flowrate _____

HVS-3 Post-Cal Flowrate _____

Collected by _____

Date Received by Lab _____

Received by _____

University of Rochester Lead-In-Dust Study

Water Sample Instructions to Families

1. The tap water sample should be taken from the cold water faucet of the kitchen.
2. The first water sample should be water that has been standing in the pipes for at least 8 hours, so put the bottle under the faucet before you turn the water on.
3. The water should be turned on so that it flows at a moderate rate.
4. The second sample should be obtained in a second bottle and collected 1-minute after the first sample is completed.
5. There are two main options for the time a sample is taken: (a) it can be taken first thing in the morning, or (b) if all of the residents of the household have been out of the house for the entire day it can be taken at the end of the day (i.e. dinner time).
6. We will provide a labeled plastic bottle for each sample. Each bottle should be completely filled with the water.
7. Please write the number of hours since the water was used in the space provided on the label of the bottle.
8. We will return to pick up the samples the following date __:__ a.m. / p.m.

LOZIER LABORATORIES

CHAIN OF CUSTODY RECORD

Client Name: _____

Mailing Address: _____

Project Name: _____

SAMPLE NUMBER	DATE	TIME	LOCATION	SAMPLE TYPE	ANALYSIS						NUMBER OF CONTAINERS	REMARK	

SAMPLED BY: _____
SIGN _____

RELINQUISHED BY: 1
SIGN _____
DATE _____ TIME _____

2
SIGN _____
DATE _____ TIME _____

3
SIGN _____
DATE _____ TIME _____

4
SIGN _____
DATE _____ TIME _____

RECEIVED BY: 1
SIGN _____
DATE _____ TIME _____

2
SIGN _____
DATE _____ TIME _____

3
SIGN _____
DATE _____ TIME _____

4
SIGN _____
DATE _____ TIME _____

METHOD OF SHIPMENT:

SIGN _____

RECEIVED FOR LABORATORY BY:
SIGN _____ DATE _____ TIME _____

LOZIER LABORATORIES

**CHAIN OF CUSTODY
RECORD**

Client Name: _____

Mailing Address: _____

Project Name: _____

SAMPLE NUMBER	DATE	TIME	LOCATION	SAMPLE TYPE	ANALYSIS								NUMBER OF CONTAINERS	REMARK	

SAMPLED BY: _____
SIGN _____

RELINQUISHED BY: 1 SIGN _____ DATE _____ TIME _____	2 SIGN _____ DATE _____ TIME _____	3 SIGN _____ DATE _____ TIME _____	4 SIGN _____ DATE _____ TIME _____
RECEIVED BY: 1 SIGN _____ DATE _____ TIME _____	2 SIGN _____ DATE _____ TIME _____	3 SIGN _____ DATE _____ TIME _____	4 SIGN _____ DATE _____ TIME _____

METHOD OF SHIPMENT:

 SIGN _____

RECEIVED FOR LABORATORY BY:
 SIGN _____ DATE _____ TIME _____

81

University of Rochester Lead-In-Dust Study

CHECKLIST

This checklist is to be completed by the interviewer at the beginning and end of each visit. Please check with the Team you work with before each home visit to be sure that the forms and supplies are in the home packet.

Please check the packet when the home visit is done, before driving away, to be sure that all the forms have been completed and none are missing. It would be very helpful if you scan all forms for thoroughness.

INTERVIEWER

Checklist-White
Contact Sheet (copy)-White
Form 100 Eligibility Form-White

Cover-Purple
Consent Form-Purple
Form 200 Interview Form-Purple

Consent Form for parent to read and keep-White
Handwipe Form-Yellow
Water Sampling Instructions for Parents-Blue
Pamphlet on Lead Poisoning for Parents-Orange
Intervention Instructions for Parents-Ivory

Chain of Custody for \$25.00
Gift Certificate-White
\$25.00 Gift Certificate
\$10.00 Gift Certificate for
homes which have been
identified as reliability checks

Intervention Supplies:
LEDIZOLV
SPRAY BOTTLE
DERRICK THE DINOSAUR BOOK
PAPER TOWELS

Hair Root Analysis Consent Form-White
Hair Root Analysis Questionnaire-White
Hair Root Chain of Custody Form-White

OTHER

Form 201 Sibling Form-White
Treat for Child: Coloring Book, Crayons, etc

Form 100 Spanish Form-Pink

Form 200 Spanish Form-Pink
Form 201 Spanish Form-Pink

Sample Grid
Telephone
City Map

ENVIRONMENTAL TECHNICIAN

Baseline Dwelling Characteristics-Golden Rod
Soil Sample Plot Sketch-Golden Rod
Soil Sampling-Golden Rod

External Dust Sampling-Golden Rod

Floor Plans-Pink
1st floor-Pink
2nd floor-Pink
basement floor-Pink
extra floor-Pink

Internal Dust Sampling Form-Pink

COURIER

XRF Calibration-Blue
XRF Measurements-Blue
Chain of Custody Form for
\$25.00 Gift Certificate-White

\$25.00 Gift Certificate
Chain of Custody Form for Blood-Pink
Chain of Custody Form for Water-Blue

CLINICAL TECHNICIAN

Wadsworth Laboratory Lead Requisition (4)
Chain of Custody Form
Aluminum Foil
Red Bio-Hazard Labels
Container for Shipping

U of R Ferritin Requisition (4)
Chain of Custody Form
Aluminum Foil
Red Bio-Hazard Labels
Large Baggie

Tackle Box
Cooler and frozen ice pack

