Chapter 15: Clearance

TABLES

FIGURES

Chapter 15: Clearance

How To Do It

1. **Qualifications for clearance examiners**. The owner, funding agency, certified abatement contractor, or certified renovation contractor should select the clearance examiner, preferably before lead-based paint hazard control work begins.

   - Clearance on all projects involving abatement (as defined by EPA) must be done by a certified risk assessor or a certified lead-based paint inspector. Check with EPA regarding qualifications for clearance of non-abatement activities.

   - For properties covered by HUD's Lead Safe Housing Rule, and those of some State regulations, clearance of non-abatement work may be performed by a certified risk assessor or lead-based paint inspector, or by a certified sampling technician, if the sampling technician is working in single family units or a multi-family dwelling unit and the associated common areas. If the clearance requires development of a random sampling plan, a certified inspector or risk assessor must develop the plan and supervise the sampling technician in its use. Not all States or localities have certified sampling technicians, and some require that non-abatement clearance be conducted only by certified risk assessors or inspectors.

   - For clearing projects covered by the EPA's Renovation, Repair, and Painting (RRP) rule, a certified risk assessor, certified lead-based paint inspector, or certified dust sampling technician can perform clearance. (See below regarding clearing multi-family housing projects.)

   - To eliminate conflicts of interest, these *Guidelines* recommend the use of a clearance examiner who is completely independent of the contractor who performs the work. HUD's Lead Safe Housing Rule requires such independence for clearance of most work in HUD-assisted target housing. (See Appendix 6 for details.)

2. **Determine the clearance area**. Obtain information from the client regarding the nature and location of the work and the dust containment (if any); for an abatement, project, validate or obtain a copy of the abatement site plan. Then determine the clearance area (i.e., the dwelling units, common areas, rooms, and/or exterior areas that are subject to the clearance examination). Clearance examiner should explain all aspects of the examination to the client.

3. **Preclearance worksite inspection on behalf of the client (optional):** As part of deciding, once the lead hazard control, renovation or maintenance work has been completed, the cleanup is done, and the floors are sealed (if necessary), whether to call for the clearance examiner, the client, contractor or maintenance supervisor may conduct a visual assessment of the clearance area to determine if there is any deteriorated paint, visible settled dust, paint chips, or paint-related debris in the interior or around the exterior of the building(s). If conducted, this preliminary visual assessment should be conducted in all the dwelling units and rooms in the clearance area, except that it may be conducted in a sample of dwelling units and related common areas in a multi-family property. After the visual assessment is passed, it may also be useful to take dust samples for quick onsite analysis before calling the clearance examiner.

4. **Wait one hour for dust to settle**. Before beginning the clearance examination, wait at least 1 hour after the hazard control, renovation, or maintenance work is finished, the cleanup is done, and the floors are sealed (if necessary) to allow any leaded-dust particles to settle. Do not enter the work area during that period.

5. **Conduct visual assessment**. Conduct a visual assessment (called a visual inspection by EPA) of the clearance area to determine if there is any deteriorated paint, visible settled dust, paint chips, or paint-related debris in the interior or around the exterior of the building(s). The visual assessment should be conducted in all the dwelling units and rooms in the clearance area, except that it may be conducted in a sample of dwelling units and related common areas in a multi-family property (see chapter 7 for unit/common area sampling methods).

6. **Complete visual assessment form**. Complete a visual assessment form for clearance, such as Form 15.1 in this chapter. If any unexplained deteriorated paint or visible dust, paint chips, or paint-related debris are found, inform the client and request that hazard controls and/or cleanup be completed, as necessary, so that dust sampling can proceed. See 24 CFR 35.1340(c) for more details of what is required under the Lead Safe Housing Rule for HUD-assisted housing (see Appendix 6).

7. **Conduct dust sampling**. After the clearance area has passed visual assessment, conduct clearance dust-wipe sampling of floors, interior window sills, and window troughs using the protocol in this chapter and Appendix 13.1, or ASTM Standard E 1728 (***www.astm.org/Standard/index.shtml***).

8. **Complete a dust sampling form** for clearance, such as Form 15.2 in this chapter.

9. **Submit dust samples for analysis** for lead to a laboratory recognized for analysis of lead in dust by the EPA's National Lead Laboratory Accreditation Program (NLLAP).

10. **Interpret the laboratory results** by comparing them to the applicable standards. In most jurisdictions, these will be the EPA clearance standards described in this chapter. If State or local standards differ from the EPA standards and the work being cleared is subject to HUD or EPA lead-based paint regulations, the most protective standards (EPA, State, or local) apply. If the work being cleared is not subject to HUD or EPA regulations, use State or local standards, if they exist. If State or local standards do not exist, use the EPA standards.

11. **Notify the client of the results of laboratory tests** as soon as they are received, so residents can reoccupy the clearance area as soon as possible if clearance is achieved, or recleaning can be started quickly if dust-lead levels exceed applicable standards.

12. **If clearance is achieved**, go to step 15. If not, go to follow steps 13 and 14.

13. **Repeat cleaning if clearance is not achieved**. If dust-lead levels are equal to or greater than the applicable standards, the client should order repeated cleaning. Clean all surfaces that the failing samples represent. Keep the clearance area secure until clearance is achieved.

14. **Continue sampling and repeat cleaning until the clearance area achieves compliance with applicable clearance standards**. Failure to achieve clearance is usually caused by inadequate cleaning and/or results when surfaces have not been made smooth and cleanable. Sometimes additional hazard control work is necessary.

15. **Complete related construction and final clearance**. After clearance has been achieved, any related construction work that does not disturb a surface with lead-based paint (all work that does disturb painted surfaces or that could generate leaded dust should be completed as part of the lead hazard control effort). If any additional paint-disturbing work is to be done in the clearance area, there should be another final clearance examination after such work to assure that the space is safe for occupancy. (See Section VII.C of Chapter 8.)

16. **Prepare report**. Prepare and deliver to the client a report of the clearance examination. You may use a format such as Form 15.3 in this chapter that includes all the information required in 24 CFR 35.1340(c) for reports on projects other than abatement, and in 40 CFR 745.227(e)(10) for reports on abatement projects. You may use the Clearance Report Review Worksheet (Form 15.4) to ensure that all the required information is included in the clearance report. See also the example of a filled-out Worksheet in Form 15.5.

17. **Compliance with disclosure and notification regulations**. The owner must disclose the scope and results of lead hazard control work, including clearance examination results, to lessees (tenants) and purchasers of the property under Federal law before they become obligated under a lease or sales contract. Also, if the housing is receiving Federal assistance, current residents must be notified within 15 days of receipt by the owner, of the scope and results of lead hazard control work, including the results of clearance examinations, in accordance with the HUD Lead Safe Housing Rule. See Appendix 6 for additional information.

I. Introduction

Clearance refers generally to combined visual and quantitative environmental evaluation procedures used to determine that no lead-based paint hazards remain in the area being cleared after lead hazard controls or paint-disturbing renovation or maintenance have been done. The specific procedures used depend on exactly what the client wants to know and what regulations and standards apply.

A. Regulations Pertaining to Clearance

The U.S. Environmental Protection Agency (EPA) issued regulations and standards at 40 CFR 745.227(e) that apply to clearance whenever abatement of lead-based paint hazards is conducted in most pre-1978 housing nationwide. These regulations apply to all abatements (i.e., measures intended to permanently eliminate lead-based paint hazards). They require that the area being cleared be free of deteriorated lead-based paint and visible dust, debris, paint chips and other residue from the work, and that lead in settled dust be below specified standards.

The U.S. Department of Housing and Urban Development (HUD) issued the Lead Safe Housing Rule, which addresses clearance at 24 CFR 35.1340(b). The regulation applies to clearance after paint stabilization, interim controls, standard treatments, rehabilitation, or ongoing lead-based paint maintenance. HUD's standards and procedures for clearance are the same as those for EPA-regulated abatement, although there are some differences in the qualifications for clearance examiners. The clearance procedures and standards described in this chapter conform to EPA and HUD regulations.

In renovations where the contract between the renovation firm and the property owner or another Federal, State, Territorial, Tribal, or local regulation requires dust clearance sampling by a certified sampling professional, EPA's Renovation, Repair and Painting (RRP) Rule allows for optional dust clearance testing in lieu of the "cleaning verification" procedure.

In projects covered by the EPA's RRP Rule for which clearance is *not* required, EPA's cleaning verification process is required. (See the description in Appendix 6.)

Some States, Indian Tribes and local governments have issued standards for clearance that may differ somewhat from the Federal requirements. In general, the most protective standards (EPA, State, or local) apply. If the EPA has authorized the State or Tribe's lead certification program, its clearance standards apply rather than the EPA's. If a local clearance standard exists and is more stringent than the State standard, use the local standard. If the work being cleared is not subject to HUD or EPA regulations, use State or local standards, if they exist. If no State or local standards exist, use the EPA standards.

If the applicable (EPA, State or local) clearance standards for lead in dust are not met, EPA and HUD require that cleaning be repeated and additional visual assessments dust testing performed until the area meets clearance standards. If dust-lead levels determined by a clearance examination remain above the clearance standards, the work is not complete; levels of lead in dust must be within clearance standards for the work to be complete.

B. Purpose and Scope of Clearance

The primary purpose of the standard EPA-HUD clearance examination is to determine whether the clearance area is safe for occupancy or for entry by unprotected workers. The clearance report must include, among other elements described in Section X.B, below, information about the lead

hazard control work, which may only be available from the owner or the contractor. You may use the Clearance Report Review Worksheet to insure that the clearance report is complete (See Form 15.4).

If exterior work was performed, the clearance examiner determines, by a visual assessment, if the ground near the work is free of debris, and, through soil-lead sampling and analysis by a laboratory recognized by NLLAP for analysis of lead in soil, if the concentration of lead in nearby soil is below the applicable soil-lead standards. Guidance on optional purposes of clearance examinations is provided in this chapter.

In this chapter, the work that generates the need for a clearance examination is referred to as "the work," regardless of whether it is abatement or interim controls of lead-based paint or lead-based paint hazards, rehabilitation, renovation, remodeling, or maintenance.

The standard Federal clearance examination has four main phases:

1. A visual assessment of: (a) interior clearance areas to identify any deteriorated paint that may be lead-based and visible dust and debris and (b) exterior areas, if exterior work was performed, to identify any deteriorated paint that may be lead-based and paint chips or other debris near the work surfaces;

2. The collection and analysis of dust samples from interior spaces by wipe sampling;

3. Interpretation of dust sampling results, and follow-up dust testing if the initial results failed to meet applicable standards and additional cleaning is necessary; and

4. Preparation and signing of the clearance report.

Interior clearance may not be necessary if the work was only on the outside and building openings (windows, doors, and vents) were tightly closed or sealed during the work. Airborne dust sampling is not recommended for clearance purposes in lead hazard control work because the results vary due to air flow, particle size, and available dust. In addition, most children are *not* lead-poisoned by inhalation (ATSDR, 1988)

Interior and exterior areas being cleared should be free of deteriorated paint that is or may be lead-based because deteriorated lead-based paint has been determined to be a lead-based paint hazard. Clinical cases of childhood lead poisoning (i.e., cases with relatively high levels of lead in the blood) often result from ingestion of leaded paint chips. If testing has shown that deteriorated paint is not lead-based, the deteriorated paint need not be repaired for the purpose of passing clearance. Interior areas being cleared should also be free of visible dust, loose paint chips and paint-related debris, and exterior areas should be free of paint chips and paint-related debris. Repair of deteriorated paint and cleanup of interior dust, paint chips, and paint-related debris must occur before dust samples are taken because the repair of the paint and cleaning of dust and debris may contaminate the area.

The collection and analysis of dust samples is a critical part of the interior clearance examination. Lead in settled house dust is the most common source of childhood lead exposure. A visual examination alone is not adequate for determining if the interior of a residence is safe for occupancy, because small dust particles are not visible to the naked eye (NCHH, 2002). Lead hazard control work and rehabilitation, renovation, remodeling, and maintenance often generate a considerable amount of leaded-dust. Studies have indicated that cleaning of leaded-dust can be accomplished

only with care and skill (HUD, 1991; NCHH, 2004). Therefore, HUD requires clearance dust sampling to determine if the work area has been cleaned adequately to meet the EPA dust clearance standard(s).

The report of the clearance examination documents the findings. The clearance examination protects *all* parties involved – the job contractor or other workers, the owner, insurance companies, and the residents. Clearance provides the contractor and the owner with an objective determination that the job site was left free of lead-based paint hazards. Clearance assures that children will be safe from lead hazards in the area being cleared as long as the work remains intact and there are not exterior sources contaminating the area. To keep the property lead-safe, the owner should follow lead-safe maintenance practices if it is known or suspected that lead-based paint remains on the property (see Chapter 6). Also, it is recommended that pre-1960 multi-family rental properties be reevaluated by a risk assessor at 2-year intervals following initial interim controls (see Chapter 5, Section VII), and may be required for housing receiving federal assistance covered HUD Lead Safe Housing Rule (see Appendix 6 for details).

A voluntary consensus standard, ASTM E2271, Standard Practice for Clearance Examinations Following Lead Hazard Reduction Activities in Dwellings, and in Other Child Occupied Facilities, may also be used for determining whether a clearance area passes or fails a clearance examination. (***http://www.astm.org/Standards/E2271.htm***) (The version of the standard as of the publication of these *Guidelines* is ASTM E2271 – 05a(2012)e1; the ASTM website should be checked to see if a subsequent edition or standard is current at the time the ASTM standard is being considered for use as part of the clearance process for a job.)

C. De Minimis Area – Minimal Area of Paint Disturbance when Clearance Is Not Required

HUD regulations do not require clearance if the total amount of paint disturbed by non-abatement work is no more than a small or minimal amount. This amount is called a *de minimis* area or *de minimis* amount. Specifically, the *de minimis* areas are areas up to:

(1) 20 square feet on exterior surfaces,

(2) 2 square feet in any one interior room or space, or

(3) 10 percent of the total surface area on an interior or exterior type of component with a small surface area (such as windowsills, baseboards, and trim).

Note that the HUD *de minimis* thresholds are different from the EPA's *minor repair and maintenance activities* thresholds (40 CFR 745.83) under its RRP Rule for work that that disrupts:

(1) 6 square feet or less of painted surface per room for interior activities; or

(2) 20 square feet or less of painted surface for exterior activities;

provided that none of the work practices prohibited or restricted by 40 CFR 745.85(a)(3) were used and where the work does not involve window replacement or demolition of painted surface areas (see Appendix 6 for details).

II. Qualifications for Clearance Examiners

A. Regulatory Qualifications

Clearance examinations are regulated by EPA and HUD, as well as by States and Tribes with EPA-authorized lead certification programs for inspection, risk assessment, or dust sampling technicians.

EPA regulations recognize two disciplines as being qualified to perform clearance examinations following abatement of lead-based paint hazards: certified risk assessors, and certified lead-based paint inspectors. Some EPA-authorized States and Tribes, however, permit only certified risk assessors to perform clearance examinations.

In addition to risk assessors and lead-based paint inspectors, HUD regulations (at 24 CFR 35.1340(b)(1)) and EPA Renovation, Repair, and Painting (RRP) regulations (at 40 CFR 745.90(a)(1)) recognize a third category, certified dust sampling technicians (originally called "clearance technicians"). These technicians are qualified to perform many non-abatement clearances, because their training does not cover random sampling, they may not conduct non-abatement clearances of multi-family properties in which clearance involves random sampling of dwelling units except under the circumstances and supervision described in the following paragraph. EPA does not allow dust clearance testing in lieu of post-renovation cleaning verification, except in limited circumstances. EPA recommends that any property owners who choose to have dust clearance testing performed after a renovation use a certified inspector, risk assessor, or dust sampling technician.

HUD regulations permit certified sampling technicians to perform clearances after non-abatement work if the clearance examination is approved and the report is signed by a certified risk assessor or lead-based paint inspector. Because sampling technicians do not have the training to randomly select dwelling units, common areas and/or exterior areas for sampling in multi-family properties, for multi-family properties where units are to be randomly selected under either the HUD regulations or the EPA's RRP Rule, the certified risk assessor or lead-based paint inspector must perform the random selection and instruct the sampling technician to conduct clearance work where selected. Also, sampling technicians do not have the training to determine that specified hazard control work has been completed (see Section VIII, below, for an explanation of this optional activity).

B. Conflicts of Interest

For clearance to achieve its purpose there must be integrity in the process, in appearance as well as in fact. People performing hazard control, rehabilitation, or maintenance work and the cleanup following such work must not know where clearance dust samples will be taken. To achieve this goal, clearance examiners should be as independent as possible of those performing the work. The clearance examiner's only concern should be that compliance with clearance standards has been achieved.

It is best practice for the owner (or the agency administering public assistance funding the work) to retain the clearance examiner, rather than having the contractor who performs the work do so. In addition, the clearance examiner should not be paid, employed, or otherwise compensated by the hazard-control or renovation contractor. The independence of the clearance examiner is generally required in projects covered by HUD's Lead Safe Housing Rule (24 CFR 35.1340(f)). It should be noted that, under EPA regulations pertaining to abatement and renovation, an abatement or renovation contractor may select and pay the clearance examiner.

Some owners of multiple dwelling units may wish to have work performed by their own trained crews, rather than contract for such services. In this case it is best practice that clearance be performed by an independent third party whose payment is not dependent on completion of the job within any particular time period. HUD regulations do permit property owners to use clearance examiners in their employ, however, provided the same in-house employees do not conduct both the work and its clearance examination. Ultimately, it is the professional integrity of those performing clearance that will determine whether the process succeeds. To minimize any perceived conflict of interest it is strongly recommended that the clearance examiner be completely independent from the person performing the lead-hazard control treatments (see above regarding HUD's Lead Safe Housing Rule).

This does not mean that job supervisors should not perform their own visual assessments of the quality of the cleaning job performed by their workers as a "pre-clearance" step. Owners, contractors, or public agencies may also find it useful to take their own pre-clearance dust samples for quick onsite analysis (using, for example, portable XRF, anodic stripping voltammetry (ASV), or potentiometric stripping analysis (PSA) technology) before calling in the clearance examiner. If the pre-clearance determination is that the area is not ready for the clearance examiner, the supervisor must order the work area to be recleaned. Such pre-clearance assessments and follow-up will make it more likely that clearance standards are met the first time around (see Section VI.A.3, below).

The clearance procedures contained in this chapter should always be included in the job specifications so that performance responsibilities are clear.

III. Time Between Completion of Cleanup and Clearance

Clearance dust sampling should be performed no sooner than one hour after completion of the final cleanup to permit airborne leaded-dust to settle. Clearance dust sampling is for *settled* leaded-dust, not airborne leaded dust, because the main source of lead exposure for children is through contact with contaminated surfaces followed by ingestion through hand-to-mouth contact. While often performed for asbestos abatement projects, air sampling does not appear to be a useful tool for determining if clearance has been achieved in lead hazard control work. Because asbestos fibers are known to have low settling velocities (that is, they take a long time to settle out of the air), air sampling can be used to determine the effectiveness of the cleanup effort in asbestos abatement jobs. But because dust particles typically generated during lead hazard control jobs are larger, denser, more spherical, and heavier, settling time is much faster. A one-hour waiting time is recommended because the additional amount of leaded-dust that would settle onto floors after one hour has been empirically found to be much less than the clearance standard for floors (40 $\mu g/ft^2$) or window sills (250 $\mu g/ft^2$) (Choe, 2000).

Entry into the area should be prohibited, and openings from the clearance area should remain closed during the waiting period to keep turbulence and resuspension of particulate matter to a minimum, as well as minimize any potential for cross contamination or unauthorized entry.

IV. The Clearance Area, and Sampling of Units, Rooms, or Areas

A. Determining the Clearance Area and Schedule

A matter of critical importance in the design of a clearance examination is determining the area that must be examined (the clearance area). Clearance examiners should reach an understanding on this with their clients as early as possible. Misunderstanding can lead to costly disputes and delays. Clearance examiners must know in advance the scope of the clearance examination (e.g., the rooms, dwelling units, common areas and/or exterior areas to be cleared) in order to make sound sampling plans and reliable fee estimates. Contractors or other persons performing the work and the associated cleaning must understand in advance the clearance examination process (i.e., visual assessment followed by dust testing), but they must not be informed about the specific sampling locations, in order to avoid their biasing their cleanup activities, even if unintentionally.

Clients should be informed that dust samples will be taken on window troughs, as well as window sills and floors, as part of the clearance examination after interior work has been done. Otherwise contractors or maintenance staff may neglect to clean window troughs (see Section VI.C.3 and Figure 15.2, below, for a definition and illustration of window troughs).

It is also suggested that the clearance examiner discuss with the client any job-specific factors that may affect the schedule for the examination and the speed with which laboratory results are needed. Possible factors include the need for reoccupancy of the clearance area or for contractors to do additional work (see Section VI.E, below, for a discussion of laboratory turnaround).

1. Interior Clearance Areas

For clearance following interior work, these *Guidelines* define the following three clearance categories, each with a different clearance area (see Section VI.C.1 and Table 15.1, below):

Category 1. No containment of dust in the rooms or common areas in which work is conducted. Because other rooms or common areas where no work was done may be contaminated, clearance must cover/represent the entire space (e.g., work area and all the rooms in the dwelling unit and/or the common areas that are associated with the work area).

Category 2. Dust has been contained to the work area. Clearance covers at least the area within the containment, plus the floor outside the containment area (to make sure contamination has not spread), plus passageways used by workers walking to and from the work area. (Alternatively, clearance Category 1 may be used.) To determine a Category 2 clearance area, the clearance examiner must know exactly where the containment was located and what passageways were used by workers.

Category 3. "Worksite only" clearance. This category of clearance is acceptable following a small amount of contained interior work not intended to be abatement that takes a short time to complete. In these cases, the clearance area may be limited to the rooms in which work has been done. (Alternatively, clearance Categories 1 or 2 may be used.)

The critical factors in determining the clearance area are: (1) the location of the work (i.e., what rooms, if interior, and what surfaces, if exterior); (2) the type and location of dust containment during the work; (3) whether the work was a low-dust or high-dust job; and (4) the duration of the job. The best way to obtain information on these factors is to observe the work in progress.

If the clearance examiner cannot observe the work in progress, he or she should request the information from the client and should determine the clearance area based on the information received. Record the information that forms the basis for the clearance area determination and include it in the final report (see Section IV.A.3, below).

Dust containment. EPA regulations on clearance following abatement (at 40 CFR 745.227(e)(8)) make the clearance area dependent on dust containment. Similarly, HUD regulations on clearance following activities other than abatement (at 24 CFR 35.1340(b)(2)) incorporate the clearance steps set forth in the EPA abatement regulation. For projects covered by the EPA's RRP Rule but not HUD's Lead Safe Housing Rule or a State or local regulation, if clearance is performed after the work as an alternative to cleaning verification, the clearance must be of at least the work area.

For interior work that may create high dust levels, containment generally includes such steps as: temporarily turning off heating, ventilating, and air-conditioning (HVAC) systems; sealing vents; and installing primitive airlocks with protective sheeting over doors to rooms in which work is being done; and covering the floors of work areas and passageways used by workers with disposable, impermeable protective sheeting. The use of primitive airlocks over work-area doors and the temporary elimination of HVAC airflow are the key methods for containing dust spread to the work area. (See Chapter 8 for a detailed discussion of containment methods as a part of worksite preparation.)

For interior work that will not create high dust levels, containment may be as little as laying protective sheeting on the floor where the surfaces will be disturbed.

Although clearance of rooms and spaces outside the containment area may not be required (except for the floor just outside the containment), complete clearance of all rooms in a dwelling unit and/or other associated spaces provides assurance that all living areas are free of lead-based paint hazards. Therefore, owners and lead hazard control contractors should carefully consider the benefits of cleaning and clearing areas outside the containment relative to the additional cost, which is often marginal.

FIGURE 15.1 Windows sealed to prevent migration of dust outside.

2. Clearance Area Following Exterior Work

Category 4. Exterior areas must be cleared following work that has disturbed or may have disturbed exterior lead-based paint. Interior clearance is not necessary following exterior work if the only work being done is on the outside and if there is dust containment due to a tightly closed opening between exterior and interior spaces (e.g. window and/or door). In this type of containment, windows, doors, vents, and other building openings near the work area are sealed or tightly closed to prevent migration of dust from the outside to the inside during the work (see Figure 15.1). If building openings near the work area are not sealed or tightly closed, clearance must be conducted in interior spaces that may have been affected. Exterior clearance is not explicitly required by EPA and HUD regulations if the only work being done is on the inside of the building. However, in such cases, exterior contamination could occur if material is thrown out of windows or unwrapped waste is laid on the ground. Therefore the clearance examiner should perform a visual assessment of the grounds near the building(s) and ask the client to remove any paint chips and other paint-related debris that are found.

Exterior clearance following exterior paint work consists of a visual assessment for visible surface dust, debris and residue, only. It is not necessary to sample soil or exterior dust unless the owner or contractor wishes to have additional assurance of no remaining hazards (see Section VII, below). The visual assessment should cover exterior painted surfaces (to identify deteriorated paint) and ground areas, vegetation and horizontal building surfaces (e.g., exterior window sills, porch floors and railings) on which dust and debris may have fallen as a result of the work. If a child under age 6 uses a porch, balcony, deck, or similar space as a play area, inspect the space thoroughly if it is near the surfaces on which work was done to make sure it is free of visible dust and debris (see Figure 15.2). In deciding the area of the exterior visual assessment, the clearance examiner should take into account the nature, extent, location, and duration of the work and the design of the containment used to limit the spread of dust and paint chips. Generally, 10 to 20 feet is an adequate distance out from the sides of the building where work was done, depending on the characteristics of work.

FIGURE 15.2 Visible paint chips and debris in the soil.

Under the standard HUD-EPA clearance procedure, the clearance examiner is not required to determine whether abatement or interim controls of soil-lead hazards have been performed satisfactorily and as specified. Therefore it is not necessary to conduct a visual assessment to identify bare soil that may have been untreated or to take soil samples. However, soil samples may be collected as an option (see Section VII, below).

3. Information for Clearance Area Determination

The clearance examiner should record information about the nature of the work in writing, whether in a narrative, a list, or on a floor plan.

- Record the source of the information (e.g., the client, the contractor, or from direct on-site observation of the work in progress).
- Record the clearance area agreed to with the client. If the agreed-upon clearance area differs from the clearance examiner's recommendation, include a written explanation of the basis for the recommendation.
- Include information about the characteristics of the work and the agreed-upon clearance area in the clearance examiner's report.

If the clearance examiner cannot obtain sufficient information on which to select Category 2 or 3 for interior clearance, the appropriate clearance category is Category 1.

B. Sampling of Rooms, Units or Areas

Note that, for the purposes of clearance sampling, hallways, stairways, entry rooms/lobbies and other significant definable spaces are considered "rooms" as well as spaces normally considered as rooms, such as bedrooms, bathrooms, living rooms, kitchens, dining rooms, family rooms. Similarly, for clearance sampling purposes, a hallway, lobby or other space within a multi-family building is considered a "unit" or a "room," as applicable.

1. Sampling Rooms within a Unit

When conducting clearance in a single-family dwelling unit, the visual assessment should be conducted in all rooms and exterior work areas within the clearance area, unless the clearance is of the worksite only (Category 3), but if the clearance area contains more than four rooms it is not necessary to collect dust samples in every room or space.

For Category 1 clearance, If the work areas were not contained, all rooms in the unit must be sampled or represented by sampling. EPA and HUD regulations on clearance require that dust samples be collected in four selected rooms in the work area (or all of the work area rooms, if fewer than four), and allow additional rooms to be sampled. The rooms selected for dust sampling are intended to be those in which young children are most likely to be exposed to dust-lead hazards. These should include, as a higher priority, the rooms in which the work was done and, as a lower priority, those rooms in which the young children sleep and/or play. (See Section VI.C.2, below.)

For Category 2 clearance, in which dust has been contained to the work area, the sampling locations are the same as for single-surface sampling Category 1, above, plus one floor sample outside of, and within 10 feet of, each containment area, and one floor sample along each passageway used by workers walking to and from the work area.

For Category 3, worksite-only clearance, the clearance area includes at least the rooms in which work was done. If the work was done in one room, the room selection is the same as for Category 1, above. If the worksite-only clearance area contains more than one room, see Section VI.C.2, especially Table 15.1, for information on room selection and sampling locations.

If there are no dust-lead hazards in the selected rooms, it is assumed that there are no such hazards in the other, unsampled, rooms. If any of the selected rooms do have dust-lead hazards, it is assumed that the other, unsampled, rooms also have them. People performing hazard control, rehabilitation, maintenance, and associated cleanup work must ***not*** know which rooms will be sampled for dust. Section VI.C.2, below, provides detailed information on selecting rooms for dust sampling. Section IX, below, provides guidance on interpreting dust sampling results and when recleaning and resampling are needed.

Clearance examiners and their clients may, if they wish, choose to collect dust samples in more than four rooms. In addition, state, tribal and/or local requirements may require more rooms to be tested. Some clearance examiners prefer to sample in ***all*** rooms in which high-dust paint-disturbing work is done. This approach has higher initial costs for the clearance examiner's time and laboratory analysis than does sampling in only four rooms, but it may save time and money in the long run because the greater amount of information allows a more focused and less costly recleaning and resampling effort if dust-lead levels exceed applicable standards.

2. Sampling Units within a Multi-family Property

If the clearance area encompasses many dwelling units in a large multi-family building or complex of similar buildings, random sampling of dwelling units, common areas and building exteriors is an option for both the visual assessment and dust sampling under the following conditions:

- For properties built during the period 1960-1977 (inclusive), random sampling of units is acceptable if the area to be cleared includes more than 10 dwelling units that have a common construction and painting history.
- For properties built before 1960, random unit sampling is acceptable if the area to be cleared includes more than 20 dwelling units that have a common construction and painting history.

This guidance applies most clearly to a large multi-family building, but it may also be applied to a group of single-family or a group of multi-family properties that are all of similar construction, were built at approximately the same time (i.e., within 2 or 3 years of each other), and have a similar painting history. If the number of units to be cleared is less than the applicable number indicated above (i.e., fewer than 11 or 21, depending on year of construction), all units must be sampled, because sampling fewer than all units would not be statistically reliable. Regardless of whether units and common areas are sampled, sampling of rooms within dwelling units should follow the guidance provided in Section IV.B.1, above, and in Section VI.C.2, below.

If the number of dwelling units in the clearance area qualifies for the unit sampling option (i.e., more than 10 dwelling units built between 1960 and 1977 (inclusive) or more than 20 units built before 1960), the visual assessment and the clearance dust sampling can be performed in randomly selected dwelling units, common areas and exterior surfaces. (The same approach is used for clearance of multiple common areas or exterior areas.) The random sampling can be performed for a portion of the housing development or for all of it. In either case the randomly selected units and common areas represent a specified group of housing units and common areas. The contractor must not know in advance which units and areas will be sampled, as this could bias the results, even if unconsciously. It is necessary to choose an adequate number of randomly selected units and common areas based on Table 7.3 of Chapter 7 and instructions associated with that table. Significant cost savings could be realized with such a sampling plan.

However, the implications of random clearance sampling should be understood fully before it is used. First, if the random sampling shows that levels of leaded dust are too high, it will be necessary to re-clean not only the affected rooms or components in the selected dwelling unit or units, but also in all the other units that the randomly selected units were meant to represent. Alternatively, all the unsampled units could be sampled individually to determine which need recleaning. The costs of repeated sampling should be compared with the costs of repeated cleaning. Regardless of whether all the represented units are sampled or recleaned, a further delay in permitting residents back into the area is possible when using random clearance sampling. Second, there has been a significant failure rate in attaining compliance with clearance dust standards. In the "Evaluation of the HUD Lead Hazard Control Grant Program" using the 1995 EPA interim guidance standards (see 60 FR 47248, September 11, 1995), with 2682 dwellings going through clearance, the failure rates at initial clearance were 20 percent for floors at 100 $\mu g/ft^2$; 6 percent for interior windowsills at 500 $\mu g/ft^2$; and 7 percent for window troughs at 800 $\mu g/ft^2$ (NCHH, 2004). In the HUD Abatement Demonstration Project using the earlier interim standards, failure rates on the initial wipe tests were 19 percent for floors at 200 $\mu g/ft^2$; 14 percent

for windowsills at 500 µg/ft^2; and 33 percent for window troughs at 800 µg/ft^2 (HUD, 1991). In one large abatement job for a public housing authority, 15 percent of the housing units failed the clearance tests and required recleaning (Jacobs, 1993a). All of these failures rates were based on standards considerably higher, i.e., less stringent, than current EPA standards. These failure rates can be partially attributed to variable contractor performance.

In spite of all these caveats, there is one special situation that may lend itself well to random clearance sampling. A large *vacant* apartment building or housing development that will not be immediately reoccupied following the work could conceivably be randomly sampled at the end of the project and, if necessary, completely recleaned. Alternatively, all units could be sampled to determine which ones require recleaning.

Whether random clearance sampling or unit-by-unit clearance sampling is performed, repeated clearance sampling should *always* be performed in all units that required recleaning. In short, most cases of lead hazard control will require that clearance dust sampling be conducted in every unit treated. The basic exception is if less than *de minimis* amounts of painted surfaces are disturbed.

V. Visual Assessment

The visual assessment that is part of the standard EPA-HUD clearance procedure has two fundamental purposes: (1) to identify any remaining deteriorated paint that is or may be lead-based paint; and (2) to identify visible dust, paint chips; or paint-related debris. The clearance examiner should inspect painted surfaces and horizontal surfaces near such surfaces in both interior and exterior locations. Any deteriorated paint that is or may be lead-based must be repaired or stabilized and any visible dust, paint chips, or other paint-related debris must be removed before dust sampling can take place. A form for visual assessments can be found at the end of this chapter (see Form 15.1).

Determining that the lead hazard control work was actually performed as specified is an important initial step. This may be done by the owner, the owner's agent, or (except for work covered by the Lead Safe Housing Rule) the certified contractor/supervisor. This is usually the responsibility of the contractor and the owner, but the clearance examiner may be asked to make such a finding, such as through the clearance examiner's contract or work order. If so, the examiner must be informed in detail of the scope of the work before the work begins in order to be on the job site while the work is being performed. See Section VIII, below, for further guidance.

For a dwelling unit, the visual assessment of interior spaces and exterior surfaces should be exhaustive, covering the entire clearance area, before any sampling of rooms or other spaces or exterior surfaces is considered. If dwelling units and common areas are sampled in a multi-family property, however, the visual assessment need cover only the sampled units and common areas, but may include more or all units and areas.

A. Visual Assessment for Deteriorated Paint

The clearance examiner should identify all deteriorated paint in the clearance area, whether interior, exterior, or both. Deteriorated paint is defined by EPA as any interior or exterior paint or other coating that is peeling, chipping, chalking or cracking, or any paint or coating located on an interior or exterior surface or fixture that is otherwise damaged or separated from the substrate (40 CFR

745.63). Nail holes and hairline cracks are not considered deteriorated paint. Paint that is separated from other layers of paint or from the substrate may appear to be loose, peeling, chipping, flaking, bubbling, blistering, alligatoring, or seriously cracking. See Section II.D.3 of Chapter 5 for an illustrated discussion of various forms of paint deterioration.

EPA and HUD regulations include chalking as a form of paint deterioration. Therefore, clearance examiners must identify chalking paint. Chalking paint (usually found only on exterior paints) has been of concern because chalking may contaminate the ground and building surfaces below if the layer of paint that is chalking is lead-based. Chalking is usually manifested by discoloration of the wall or ground below the painted surface and by a chalk-like substance that comes off on the hand after lightly rubbing the paint surface.

All deteriorated paint should be recorded on a form, such as Form 15.1, the Visual Assessment – Lead Hazard Clearance Examination form (at the end of this chapter). Results should be written down as the assessment proceeds, and the report should be precise about amounts and locations. If deteriorated paint is found, the clearance examiner should ask the client why the paint is deteriorated. If the deteriorated paint is known not to be lead-based, the examiner should record that information, identify the document that is the basis for the determination, and proceed. If the client states that he or she is not required to repair that paint, the examiner may record that and proceed. It is not expected that the clearance examiner should be a compliance official, but the clearance record should show the client's explanations, if any, for the existence of deteriorated paint.

One example of a possible explanation for the existence of deteriorated paint might be that the property has undergone rehabilitation with Federal assistance of $5,000 or less per dwelling unit. For such properties, HUD regulations (at 24 CFR 35.930(b)) do not require stabilization of deteriorated paint if that painted surface is not being addressed as part of the rehabilitation. Thus, for example, if the rehabilitation work is only window repair or replacement, deteriorated paint may remain on the walls near the windows – walls that are in the clearance area. A similar situation might occur in an unregulated renovation job of just part of a dwelling unit.

If the client does not know whether the deteriorated paint is or is not lead-based and has no other reasonable explanation for the presence of deteriorated paint, the paint surface should be made intact and the work area cleaned before completion of clearance. If the clearance area is an interior space, the paint must be repaired and the work area cleaned before collection of clearance dust samples because the paint repair might contaminate the area. Therefore, if there is any unexplained deteriorated paint, the clearance examiner should provide the client with a copy of the visual assessment form so it is clear exactly what paint should be repaired.

Tracking leaded dust from one area to another is a big problem on lead hazard control jobs. Leaded dust can be tracked on shoes from the work area to non-work areas or to the outside. Sometimes leaded dust from the outside soil is tracked into the work area. Leaded dust from a porch or non-work area can be tracked into a cleaned area. When this happens, the whole area must be cleaned. Accordingly, the clearance examiner and others visiting the worksite are advised to wear **disposable booties to minimize any cross contamination from one work area to another, or dust migration from outside the worksite into the worksite.**

B. Visual Assessment for Settled Dust and Debris

1. Interior

For an interior clearance area, there should be no evidence of settled dust or paint chips or paint-related debris following a cleanup effort. If dust, paint chips, or paint-related debris are observed, the clearance examiner should record his or her observations on a form, such as Form 15.1, and provide the form to the client. Remember to observe window troughs, as well as window sills and floors. These surfaces should all be clean because dust samples are collected from them. The client should have the relevant areas recleaned *before* clearance dust samples are collected to avoid conducting dust sampling twice. Visible settled dust provides sufficient evidence that cleanup was not adequate (see Figures 15.3 and 15.4). If recleaning is necessary, the clearance examiner should provide the client with a copy of the visual assessment form so it is clear exactly what areas should be recleaned.

There are conflicting reports regarding the use of the so-called "white-glove test," named for the concept of running one's hand in a white cotton glove along a surface to see how dusty or dirty it is, as part of the visual assessment. Some housing agencies have indicated that they find this to be a useful preliminary examination tool, while others indicate that this test almost always shows some discoloration of the glove, even if surfaces have been cleaned well. Until it has been demonstrated to effectively predict leaded dust levels, use of the "white glove test" is left to the discretion of the examiner and is not recommended by HUD. The "white glove test" is *not* a substitute for laboratory analysis of dust samples. Remember that the EPA has a cleaning verification method for projects covered by its RRP Rule (see Appendix 6) that are not covered by HUD's Lead Safe Housing Rule.

FIGURE 15.3 Visible Dust Indicates Recleaning is Needed

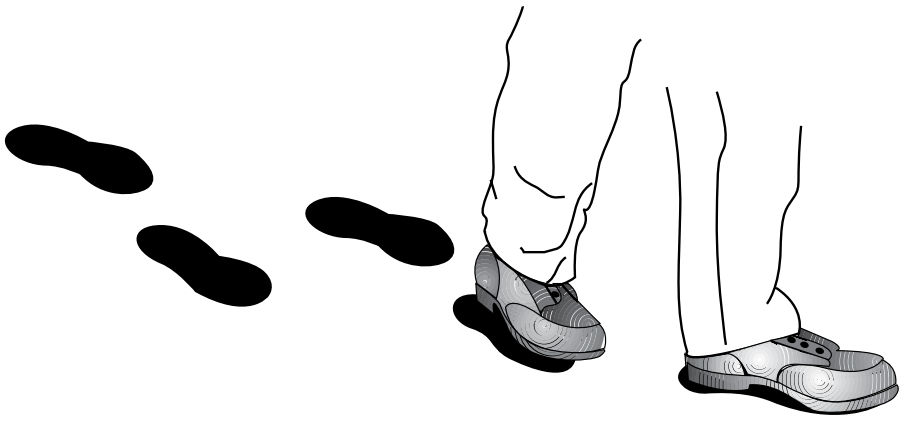


FIGURE 15.4 Tracking of Dust that may Contain Lead

2. Exterior

For an exterior clearance area, the clearance examiner, in addition to looking for deteriorated paint, should visually examine the ground, vegetation, and horizontal building surfaces (including exterior window sills) near the exterior work surfaces to determine that paint chips and other paint-related debris have been removed. Also, it is especially important that outdoor, hard-surfaced living areas such as porches, decks, and balconies that are within the clearance area and are frequented by children of less than six years of age be free of visible dust and debris. (See Section IV.A.2, above, for guidance on determining the area to be included in exterior clearance.) A visual examination of the surface for surface dust, debris and residue is usually adequate. It is not necessary to turn over or rake soil to look for paint chips unless the clearance examiner has reason to believe workers or the client may have covered up paint chips or other lead-contaminated debris with loose soil.

If exterior cleanup is necessary, the clearance examiner should provide the client with a visual assessment form explaining exactly what areas and what material must be cleaned up. Clearance has not been achieved until such cleanup has been satisfactorily completed. However, it is usually not necessary to postpone interior dust testing until exterior cleanup has been completed, provided building openings are closed during the exterior cleanup to avoid possible contamination of interior spaces. The clearance examiner should tell the client it is necessary to close building openings within 10 to 20 feet of the exterior cleanup.

C. Completion of the Visual Assessment Form

The Form 15.1 for visual assessments should be completed, signed, and dated. If no unexplained deteriorated paint or visible dust, paint chips, or paint-related debris are observed, the clearance examiner can proceed to dust sampling and analysis. If, on the other hand, further paint treatment or cleanup is required, the examiner should provide the client with such observations on a dated and signed form; and it will be necessary for the clearance examiner to return after the repair and cleanup is done, conduct another visual assessment, and complete, sign, and date a second visual assessment form to document the presence or absence of unexplained deteriorated paint. Dust sampling should not be performed until the examiner observes that the paint repair and cleanup has been satisfactorily done.

VI. Clearance Dust Sampling

A visual assessment alone is not adequate for determining if a residence is safe for occupancy, because small dust particles are not visible to the naked eye. A person with normal eyesight cannot detect individual dust particles smaller than 50 µm in diameter (Olishifski, 1983). Data indicate that a significant percentage of the dust generated during lead hazard control work is smaller than 50 µm (Mamane, 1994; NIOSH 1993b). Because these smaller dust particles are associated with an increased risk of lead poisoning, clearance dust testing is required to determine quantitatively if a leaded dust hazard remains following lead hazard control work. The dust testing involves two steps: sampling the dust, and analyzing the dust for lead.

A. Sampling Methods

1. Wipe Sampling

Dust samples must be collected using wet wipes. The recommended protocol for sample collection is either Appendix 13.1 of these *Guidelines;* ASTM Standard Practice E 1728,

"Standard Practice for Field Collection of Settled Dust Samples Using Wipe Sampling Methods for Lead Determination by Atomic Spectrometry Techniques"; or the EPA report, "Residential Sampling for Lead: Protocols for Dust and Soil Sampling," March 1995 (EPA, 1995a).

Neither EPA nor HUD currently recognizes a standard for collecting and evaluating vacuum samples of dust as a part of a lead-based paint hazard risk assessment or clearance examination. Wipe sampling yields a measure of dust-lead loading (in micrograms of lead per square foot or square meter), whereas vacuum sampling can provide a measure of the concentration of lead in the dust (in parts per million or micrograms per gram) as well as loading. Wipe sampling, however, is the required method of dust collection because it is simple, inexpensive, and has been used successfully for a number of years. Research has indicated that wipe sampling results correlate well with blood-lead levels in children (Lanphear, 1994; Farfel, 1992). The wipe sampling protocols in Appendix 13.1 and in ASTM E 1728 are equivalent to the method used in the Lanphear study.

Clearance wipe samples must be analyzed for lead by a laboratory recognized by the EPA under the National Lead Laboratory Accreditation Program (NLLAP) for analysis of lead in dust with one exception. The exception is for analyzing samples collected where States or Tribes operate an EPA-authorized lead-based paint inspection certification program that has paint testing requirements different from the EPA requirements, in which case the State or Tribal requirements must be followed. NLLAP-recognized laboratories are required to use the same analytical methods for analyzing the sample that they used to obtain NLLAP recognition.

- EPA established NLLAP to provide the public with laboratories that have a demonstrated capability for analyzing lead in paint-chip, dust, and/or soil samples at the levels of concern stated in these *Guidelines*. NLLAP monitors the analytical proficiency, management and quality control procedures of each laboratory participating in the program. NLLAP does not specify or recommend analytical methods.

- See Chapter VII, Section VI.I for further information of NLLAP procedures.

- Field-portable XRF analysis has been used for measurement of lead in dust (Sterling, 2000; Harper, 2002) or soil (EPA, 2004; Binstock, 2009) with varying degrees of success; these methods do involve collecting a sample of the medium, so samples collected from target housing or pre-1978 child-occupied facilities, must be analyzed by a laboratory recognized by NLLAP for analysis of lead in the particular medium. The laboratory may be a mobile laboratory, field sampling and measurement organization, or a fixed-site laboratory, as discussed in Section II.E.6, above.

Information on this program, including an up-to-date list of fixed-site and mobile laboratories recognized by NLLAP, can be obtained on the EPA web site at ***http://www.epa.gov/lead/pubs/nllap.htm***, or by calling the National Lead Information Center at 800-424-LEAD. (Hearing- or speech-challenged individuals may access this number through TTY by calling the toll-free Federal Relay Service at 800-877-8339.)

2. Composite Sampling

Under EPA and HUD regulations, dust wipe samples may be either single surface or composite. Each single-surface sample is a separate wipe from a specific location. It is placed in a separate container and is analyzed separately. A composite sample can contain up to four wipes from four

different locations, but the locations must be from the same type of component, e.g., hard floors from four different rooms, or interior window sills from four different rooms. Wipe samples are composited in the field, not in the laboratory, by inserting up to four wipes from four surfaces into the same container. The laboratory analyzes all four wipes as one sample using a modified analytical procedure. The individual wipes in each composite are called "subsamples."

Acceptable recovery rates (i.e., within the range of 80 to 120 percent of the "true" value) have been found when no more than four wipes are analyzed as a single sample (EPA, 2001b; Jacobs, 1993c). Testing reported in 2011 among multiple NLLAP-recognized laboratories identified two sample preparation methods for four-wipe composite dust wipe samples that are capable of meeting NLLAP requirements for accuracy (recovery) and precision. (White, 2011)

In 2011, the American Industrial Hygiene Association Laboratory Accreditation Programs, LLC revised the "Specific Additional Requirements" in Policy Module 2C for its Environmental Lead Laboratory Accreditation Program (ELLAP). Laboratories accredited by ELLAP for lead analysis of dust wipes are recognized by NLLAP (and similarly for lead in paint chips and soil). As of the publication of these *Guidelines*, the ELLAP policy covers accreditation (and, hence NLLAP recognition) of laboratories analyzing composited wipes, for which "all requirements for wipes listed in Policy Module 2C apply, but with the additional requirement that each batch of samples and associated QC samples shall contain the same number of wipes, i.e. composited samples that contain two wipes are to be analyzed in a batch containing QC samples to which two wipes were added as matrix." (ELLAP policy 2C.4.12, which is linked from ***http://www.aihaaccreditedlabs.org/PolicyModules/Pages/2011%20Policy%20Modules.aspx***. Additional composite-specific requirements are found in the ELLAP application form linked from ***http://www.aihaaccreditedlabs.org/programfees-guidelines-forms/Pages/default.aspx***.)

While these *Guidelines* recognize the use of composite sampling of dust, they generally do not encourage it for the following reasons:

- Most laboratories that are recognized by EPA for lead analysis (i.e., NLLAP-recognized laboratories) discourage clients from submitting composite dust wipe samples.
- The lack of a inter-laboratory proficiency program for analysis of composited samples may make the data less convincing in case of a dispute.
- Compositing offers only limited amount of information. If one composite sample has dust lead levels exceeding applicable standards, all components represented by that composite sample will have to be recleaned, or each room will need to be resampled individually. In contrast, if one of the single-surface samples fails, recleaning is necessary only in the room in which the failed sample was taken plus all unsampled rooms (or each unsampled room could be sampled).
- The decision criterion for evaluating the results of composite clearance samples is more stringent than that for single-surface samples. In accordance with EPA regulations, the EPA standard for dust-lead hazards must be divided by one-half of the number of subsamples to determine the standard against which the results of a composite clearance sample must be evaluated (40 CFR 745.227(e)(8)(vii)). Thus, with the EPA dust-lead hazard level for floors being 40 µg/sq. ft. as of the publication of these *Guidelines,* the standard for a composite floor sample with four subsamples is 20 µg/sq. ft. Such a low composite standard increases the likelihood of failing clearance.

- Laboratories often separate composite samples and analyze each wipe separately because their equipment and sample preparation procedures are set up for individual wipes, rather than analyzing the composited samples together. As a result, the cost of the composite analysis may well be at least as high as for analyzing the wipes submitted as separate samples.
- The cost of single-surface sampling has declined since the 1990s, so the money spent in single-surface samples is more than made up by having good data.

Research has shown the benefit of composite dust wipe testing for the case of high-dust jobs involving lead-based paint. (Cox, 2011) For such jobs, lead in dust next to the walls was three times more difficult to clean than lead in dust nearer the center of the rooms; clearance using single-wipe samples collected next to the walls was much more likely to fail; and "four-wipe composite sampling within each room (two randomly selected from the perimeter and two randomly selected from the interior) provided a very reliable method for detecting clearance failure (99% or greater) versus a randomly selected single wipe sample per room (50% or less)."

The following recommendations should be observed if composite dust wipe sampling is conducted:

- Wipes used for composite dust wipe samples should meet the requirements of ASTM Standard E 1792.
- Whenever composite sampling is contemplated, clearance examiners should check with the analytical laboratory to determine whether it analyzes composite samples and, if so, whether special quality assurance practices are needed. For example, clearance examiners should confirm whether the laboratory is able to analyze composite samples with wipes that meet ASTM Standard E 1792 (Battelle, 2002).
- A single composite sample should not contain subsamples from different component types, e.g., floors and interior window sills, in the same composite sample.
- When composite samples are being taken, separate composite samples are required for each dwelling unit sampled.
- The surface areas of subsamples within a composite sample must be very similar in order to avoid oversampling a room.
- All the areas to be wiped for a composite sample should be identified before starting to perform the wiping for the subsamples. After preparing the container for a composite sample, put on the glove(s) and complete the wiping procedures for all subsamples.
- A new wipe should always be used for each spot sampled. Carefully insert each wipe subsample into the same container.
- No more than four different wipes should be inserted into a single container for a composite sample. As noted above, acceptable recovery rates (i.e., within the range of 80 to 120 percent of the "true" value) have been found when no more than four wipes are analyzed as a single sample (EPA, 2001b; Jacobs, 1993c).

- Composite samples should not be taken from rooms that have dramatically different conditions. For example, if the clearance examiner has some reason to believe that cleanup was not performed adequately in a room, a single-surface sample should be collected there. In some cases both single-surface samples and composite samples may be needed for the same component.

3. On-site Dust Testing

EPA and HUD allow on-site analysis of dust samples as long as the laboratory analyzing the samples is recognized for on-site ("mobile") analysis of lead in dust by EPA under the National Lead Laboratory Accreditation Program (NLLAP). Methods exist for reliably screening wipe samples on-site rather than in a fixed laboratory; note that this preliminary screening is not the same as clearance, but may be used by the owner, contractor or clearance examiner as part of determining whether to proceed to clearance testing. These include portable X-ray fluorescence (XRF) analysis and anodic stripping voltammetry (ASV) (Ashley 2001; EPA, 2002b; Clark, 2002). These methods may provide testing results much more quickly than fixed laboratory analysis, and so they may save time and money, reduce relocation difficulties, facilitate cooperation by both landlords and tenants, and accelerate environmental investigations in cases of children with elevated blood-lead levels.

In States and Tribal lands where EPA is operating a lead certification program, wipe samples for a clearance examination must be analyzed by a laboratory recognized by EPA under the National Lead Laboratory Accreditation Program (NLLAP) for analysis of lead in dust. If, in these States, an EPA-recognized laboratory wishes to perform on-site analyses of dust wipe samples, it may do so. In States or Tribal lands where the State or tribe is operating an EPA-authorized lead program, the same requirements generally apply, although there may be some differences (EPA, 2002a). While EPA clearance regulations and program procedures apply only to abatement activities (and the option for clearance in projects covered by the RRP Rule), HUD regulations and many State regulations apply the same procedures to non-abatement activities. On-site analysis (just like fixed-site laboratory analysis) of dust for lead for clearance testing (or for risk assessment or lead hazard screening) of target housing may only be done by an NLLAP-recognized laboratory. Thus a certified risk assessor, lead-based paint inspector, or sampling technician who wishes to conduct on-site dust testing as part of a clearance examination must conduct the analysis as part of working for an NLLAP-recognized laboratory, whether as an employee or a subcontractor of the laboratory.

Any person who is trained and otherwise qualified (e.g., holding a state radiation license) to operate the XRF instrument, or use the ASV or PSA method may use these methods to conduct dust testing in a preliminary screening to determine whether the clearance area is clean and ready for the clearance examination. A person conducting a preliminary screen does not have to be a certified lead-based paint inspector, certified risk assessor, or a certified dust sampling technician. To conduct a clearance examination or a risk assessment, however, one must be certified. Owners and contractors may wish to use appropriately certified individuals to conduct such screening tests to minimize the likelihood of clearance failure. State regulations on the use of devices with radioactive elements must be observed.

B. Clearance Dust Sampling and Sealant Application

Wipe samples should be collected after any application of a sealant on a rough, unfinished, horizontal surface, such as a floor or window sill, not before. In lead hazard control programs, and especially after paint removal, coating with a sealant is often one of the final measures completed. It is recommended for wood and concrete surfaces that are not coated with paint, varnish, polyurethane, or other coating. The purpose of sealing floors or sills is not to trap leaded-dust underneath the sealant, but to provide a surface that can be cleaned effectively by the resident. The type of surface determines the type of sealant. For example, wooden floors should either be painted with deck enamel or coated with polyurethane; concrete floors should be sealed with a concrete sealant; and tile floors should be sealed with appropriate wax or other coating. The lead-safe maintenance program should check the integrity of floor sealants at least yearly.

C. Location and Number of Clearance Dust Samples

Table 15.1 presents the minimum number and location of clearance dust samples to be taken in various circumstances. The number and location of samples depend on several factors: whether dust containment was used, the number of rooms in the clearance area, whether composite or single-surface samples are collected, and whether the clearance protocol must be a standard HUD-EPA protocol or can be a special worksite-only protocol that may acceptable in certain circumstances.

1. Clearance Categories

The four categories of clearance are shown in Table 15.1. Remember that clearance is not required following small work in which the amount of paint disturbed is less than the *de minimis* amounts defined in Section I.C, above.

Clearance Category 1 in the Table 15.1 is the standard HUD-EPA dust sampling protocol for clearance after interior work that has not used dust containment between work areas and non-work areas. Dust containment generally includes temporarily turning off HVAC systems, sealing vents, and installing plastic sheeting over doors to rooms in which work is being done. See Chapter 8 for guidance on containment to minimize dust migration. Also, clearance examiners should use Clearance Category 1 if information on the location and design of containment is not available.

Clearance Category 2 in Table 15.1 is the standard HUD-EPA dust sampling protocol for clearance after interior work that has used dust containment between work areas and non-work areas. Categories 1 and 2 constitute the recommended protocol for dust sampling in most clearance examinations. Categories 1 or 2 must be used if the work includes abatement of lead-based paint hazards, as defined and regulated by EPA and State or Tribal programs authorized by EPA. Categories 1 or 2 must also be used if the clearance is required by the HUD Lead Safe Housing Rule, except in certain cases in which worksite-only clearance is also permitted.

Clearance Category 3 in Table 15.1 is the recommended dust sampling protocol for worksite-only clearance following a small amount of interior work that was of short duration, generated little dust, and was contained. The HUD Lead Safe Housing Rule allows this worksite-only clearance procedure in housing receiving up to $5,000 per housing unit in Federal rehabilitation assistance and also in housing that is receiving certain other types of Federal assistance and is undergoing continuing lead-based paint maintenance. The EPA does not allow worksite-only

clearance after abatement work in States for which it operates the lead certification program. (See also sec. VI.C.5.) EPA does allow the option of clearance on work covered by the RRP Rule (40 CFR 745.85(c).); if there is no other requirement (such as from HUD's Lead Safe Housing Rule, or a State or tribal regulation) to clear the entire unit, worksite-only clearance is allowed.

Clearance Category 4 in Table 15.1 pertains to exterior paint-disturbing work. Dust sampling of exterior locations is not required. Dust testing of exterior living areas, such as porches and balconies, is optional. There is no EPA dust-lead hazard standard for exterior surfaces. Dust sampling of interior rooms is necessary, however, if building openings near the work surfaces are not sealed or tightly closed during the work to preclude the migration of work-generated dust into interior spaces. The clearance examiner must exercise professional judgment in selecting rooms that may have been contaminated during the work.

Each of these clearance categories has different dust sampling protocols, depending on whether the wipe samples being taken are single-surface or composite.

The recommended number and location of dust samples is the same for dwelling units, common areas, and child-occupied facilities. A child-occupied facility is defined by EPA as "a building or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours (see Figure 15.5). Child-occupied facilities may include, but are not limited to, day-care centers, preschools and kindergarten classrooms" (40 CFR 745.223).

Once a clearance examiner has determined which clearance category(ies) apply to the job at hand, he or she then has the following decisions to make: (1) which rooms to sample; (2) which locations within rooms to sample; and (3) whether to use single-surface or composite samples. If the clearance examiner wishes to take samples above the minimum required, she or he must first ensure that the owner or owner's agent paying for the clearance examination agrees to the collection and analysis of the additional samples. These issues are discussed in the following paragraphs.

FIGURE 15.5 Indications that children are present.

Table 15.1 Minimum Number and Location of Dust Samples

Clearance Category	Number and Location of Single-Surface Wipe Samples	Number and Location of Composite Wipe Samples*
Category 1: Standard HUD-EPA clearance protocol following interior work with no dust containment.	The clearance area is the entire dwelling unit, common area, or child-care facility. If the clearance area contains four or fewer rooms, all rooms must be sampled. If there are more than four rooms, select at least four rooms for sampling. If the unit, common area, or facility being cleared consists of two or more rooms, collect two samples from each room selected for sampling: ✦ One from the floor. ✦ One from an interior window sill or window trough, if present, alternating from sill to trough between rooms. If the unit, common area, or facility being cleared consists of only one room, collect three samples: an interior window sill (if present), a window trough (if present), and the floor.	The clearance area, the number of rooms to be sampled, and room selection are the SAME as for Category 1 single-surface sampling. If the unit, common area, or facility being cleared consists of two or more rooms, collect three subsamples from each room to be sampled: ✦ One from the floor. ✦ One from an interior window sill, if present. ✦ One from a window trough, if present. If the unit, common area, or facility being cleared consists of only one room, sampling locations are the same as for Category 1 single-surface sampling locations; composite samples cannot be taken.
Category 2: Standard HUD-EPA clearance protocol for interior work with dust containment.	The minimum clearance area includes the rooms in which work was done, the area outside each containment area, and each passageway used by workers walking to and from the work area. Sampling locations are the same as for single-surface sampling Category 1, plus: ✦ One floor sample outside of, and within 10 feet of, each containment area. ✦ One floor sample along each passageway used by workers walking to and from the work area.	The minimum clearance area is the SAME as for single-surface sampling Category 2 single-surface sampling; If work was done in more than one room, collect: ✦ Three subsamples from each room to be sampled: ✦ One from the floor. ✦ One from an interior window sill, if present. ✦ One from a window trough, if present. ✦ One floor sample outside of, and within 10 feet of, each containment area.

Category 2: Standard HUD-EPA clearance protocol for interior work with dust containment.		✦ One floor sample along each passageway used by workers walking to and from the work area. If work was done in only one room, all samples must be Category 2 single-surface samples; composite samples cannot be taken.
Category 3: Worksite-only clearance for a small amount of interior work of short duration, with low dust generation and dust containment.	The minimum clearance area includes the rooms in which work was done. Room selection is the same as single-surface sampling Category 2. If the clearance area contains more than one room, collect three samples from each room to be sampled: ✦ One from the floor within 5 feet of a work surface. ✦ One from an interior window sill or window trough, if present, alternating between rooms. ✦ One from the floor near the main doorway used by workers to access the room. If work was done in only one room, collect four samples: two from the floor (in the same locations as above), one from a sill (if present), and one from a trough (if present).	The minimum clearance area, the number of rooms to be sampled, and room selection are the SAME as for Category 3 single-surface sampling. If the clearance area contains more than one room, collect four subsamples from each room to be sampled: ✦ One from the floor, within 5 feet of a work surface. ✦ One from an interior window sill, if present. ✦ One from a window trough, if present. ✦ One from the floor near the main doorway used by workers to access the room. If work was done in only one room, all samples must be Category 3 single-surface samples.
Category 4: Exterior paint-disturbing work.	Dust sampling is generally not required for exterior work if building openings near the work surfaces were tightly closed or sealed during the work. Optionally, collect one floor sample from each porch or balcony where children under age 6 play and paint-disturbing work was done. If building openings near the work surfaces were not sealed or tightly closed, conduct Category 1 interior dust sampling in rooms that may have been contaminated.	SAME as for Category 4 single-surface sampling.

* *These* Guidelines *generally do not encourage collection of composite dust-wipe samples for the reasons stated above in Section VI.A.2, but they are permitted under Federal regulations.*

2. Selection of Rooms

For the purposes of clearance sampling, hallways, stairways, entry rooms/lobbies, and other significant definable spaces are considered "rooms" in addition to bedrooms, bathrooms, living rooms, kitchens, dining rooms, and family rooms. Closets are not considered to be separate rooms unless they are unusually large. Most closets are considered to be part of the room to which they are attached.

If the clearance area includes one to four rooms, all rooms must be sampled. If the clearance area includes more than four rooms in a dwelling unit, the clearance examiner may select just four rooms to sample, and those rooms will represent all rooms within the clearance area. Clearance examiners and their clients may, if they wish, choose to collect dust samples in more than the minimum number of four rooms. If the clearance area contains more than four rooms, sampling all rooms in the clearance area with single-surface samples, although more expensive, gives the most information and permits targeted recleaning if any of the samples fail. Time and labor costs saved in recleaning might justify the added cost of dust sampling. An alternative to sampling in all rooms is to sample in those rooms in which high-dust paint-disturbing work has been done.

If the clearance area contains more than four rooms, the selection of four rooms for clearance dust sampling requires judgment. Two questions should guide the clearance examiner in selecting rooms to be sampled:

(1) Where was the work done?

(2) Where do young children spend their time?

Of the two, the first is the more important for clearance dust sampling. The first priority is to sample rooms where most of the dust-generating work was done. If that criterion is not sufficient, however, the clearance examiner should select rooms where children less than six years old spend the most time. If no information on children's activity patterns is available or no young children are currently living in a dwelling unit, the following rooms can be considered as having frequent child contact: the bedroom that the youngest child would be likely to occupy (usually the smallest), the family room or play room, the kitchen, the living room, and the dining room.

Thus, if, for example, there are more than four rooms in the clearance area and paint-disturbing work was done in all the rooms, the clearance examiner should select rooms according to where, in his or her judgment, the most dust-generating work was done. If the work done in the various rooms did not vary much in dust generation, or if there is inadequate information on which to judge likely dust generation, the selection of rooms should be based on where children spend the most time. If only one, two or three rooms in the clearance area were work areas, those rooms should be selected, and then additional rooms should be selected according to where young children spend time. If exactly four rooms in the clearance area were worksites, those four should be selected.

Although the same general principles apply for common areas as for dwelling units, it is recommended that all rooms in the clearance area of common areas be selected if the rooms vary widely in size, construction, age, configuration, or use.

3. Selection of Locations Within Rooms

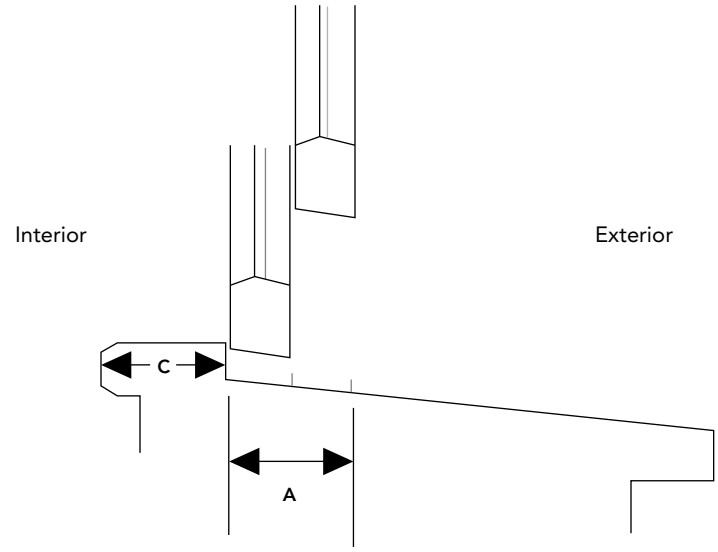
Within rooms, clearance dust samples must be taken from floors (see figure 15.6), interior window sills (if present, see Figure 15.7) and window troughs (if present). One floor sample or subsample must be collected in each sampled room. In multi-room clearance examinations using single-surface sampling, the clearance examiner should alternate sampling sills and troughs, i.e., collect a sill sample in one room, a trough sample in the next, and so forth. Where rooms have more than one window, the window to be sampled should be alternated from room to room to avoid bias in sampling. There are several ways to choose which window(s) to sample. For example, sample the rightmost window in the first room, the next one to the left in the next room, and so on, starting over when the leftmost window is reached. Similarly, sampling can start with the leftmost window and move rightward. The windows can also be randomly sampled using a random number generated by coin-flips, a die, a calculator or a computer spreadsheet. Thus, in multi-room clearance areas, a minimum of two single-surface wipe samples must be taken in each sampled room if the room has a window that can be sampled: one floor sample and one sample from either the sill or the trough.

If composite sampling is used, alternating between the sill and trough is not recommended; subsamples of each composite sample should be collected from the same component type in each sampled room. In single-room clearance areas, both the sill and the trough should be sampled, so three wipe samples must be taken in the room.

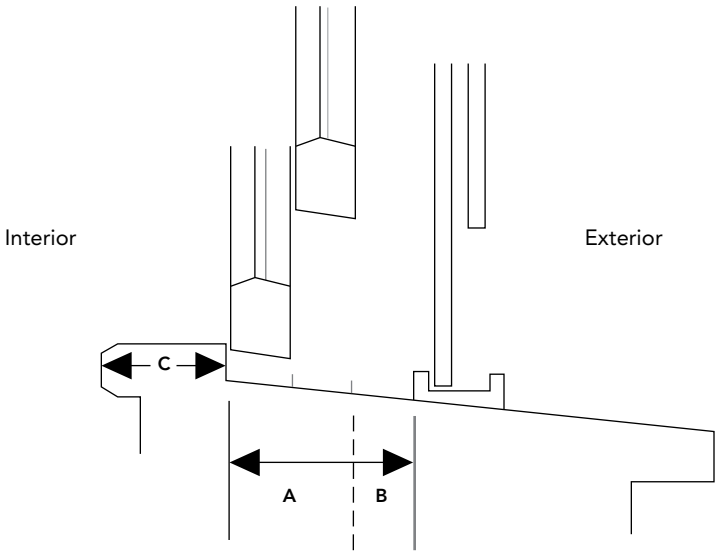
An interior window sill (sometimes called the stool) is the window ledge in front of the bottom of the closed window sash as seen while looking out the window(see Figure 15.7 for an illustration). A double-hung window has two parts that move up and down in the window frame. A window trough is the part of the window sill in which both sashes of a double-hung sash sit when lowered or, for a casement window, where the bottom of the casement sash is when it is closed, commonly called the well. If there is a frame for a storm window or a screen, the trough extends out to such a frame (see Figure 15.8). Do not sample the exterior window sill outside

FIGURE 15.6 A floor that may be tested.

FIGURE 15.7 A window sill and trough that may be tested.



1. Sectional view of window (with no storm window) showing window trough area, A, to be tested. Trough is the surface where both window sashes can touch the sill when lowered. The interior window sill (Stool) is sown as area C. Interior window sills and window troughs should be sampled separately.



2. Sectional view of window (including storm window) showing window trough area, A and B, to be tested. Trough extends out to storm window frame. The interior window still (stool) is shown as area C. Interior window sills and window troughs should be sampled separately.

Courtesy: Warren Fredman

FIGURE 15.8 Window Locations for Dust Sampling.

of the trough. EPA has not established a dust-lead hazard standard for exterior window sills. They are usually washed by rain and do not have the same dust-lead loadings as troughs.

Clearance examiners must exercise judgment in selecting the exact locations in a room from which to collect wipe samples on the floor, interior window sill, or window trough. Generally, samples should be taken either from locations near the area where the work was done, from nearby high-traffic areas (around doorways, for example), or from areas with which young children are likely to be in contact. Floor dust samples may be taken from either carpeted floors or hard-surfaced floors. The clearance examiner may determine which specific site is best based on the type of treatment, visual observation, and professional judgment.

Those performing the work must not know exactly where the clearance samples will be collected.

4. Sampling Outside the Containment Area

If dust containment is used (i.e., sealing vents and installing plastic sheeting on doors between work areas and non-work areas), one floor sample must be taken outside each containment area if the clearance area is defined as being within the containment. The floor sample should be taken within 10 feet of the containment to determine the effectiveness of the containment.

If dust containment is used, one floor sample must also be taken along each passageway used by workers walking to and from the work area, to determine the effectiveness of measures taken to control the tracking of leaded dust.

5. Worksite-Only Sampling

For small, low-dust non-abatement jobs, the certified renovator (or, for jobs not covered by the abatement or RRP rules, the project supervisor) is responsible for designing the containment system that will be used. In some cases, it may be acceptable for containment to consist of merely tape plastic sheeting on the floor extending at least 6 feet from the surface being worked on, and not install further containment. A low-dust job is defined generally as work that creates a small amount of dust that will not spread beyond 6 feet from the painted surfaces being disturbed. This set-up may be acceptable for such jobs as small repainting work that does not require scraping of large areas, or window replacement, if dust-limiting work practices are used. See Table 8.1 in Chapter 8 for guidance on work-site preparation. This set-up is not acceptable if an EPA-regulated abatement is performed, and it is not acceptable for high-dust jobs involving the scraping of large painted areas or the demolition of walls or ceilings or other large components.

The clearance examiner should take two floor dust samples in each room or space where work was done:

- One floor sample should be taken within 5 feet of the surface(s) that were worked on. This sample is to determine whether a significant amount of dust generated by the work remains nearby after the work and cleanup. If work was done on surfaces more than 10 feet apart, the sample should be taken near where the clearance examiner expects the greatest amount of dust to have been generated.

Another floor sample should be taken the near the door that workers usually used, if this is known or can be reasonably presumed based on the work location, the room layout, material storage and holding locations, etc. If the workers' entering and exiting pattern is not known or cannot be presumed, the sample should be taken the near the main door to the room or space. This sample is to determine whether workers tracked lead-contaminated dust into the unprotected part of the room or space.

- In addition, one should be taken from a window sill (if present) and one from a window trough (if present).

6. Composite Sampling: An Example

When the work is similar in a clearance area with multiple rooms in the same dwelling unit or child-occupied facility, or in multiple common areas of the same property, composite clearance dust samples may be collected.

An example of a composite sampling scheme is as follows: A house has undergone an abatement job involving extensive interior paint removal and has passed a visual examination. Before the work began, the owner and the clearance examiner have agreed to use composite clearance dust sampling to minimize initial laboratory expenses, based on the dust-lead analysis price schedule of the EPA-recognized laboratory being used. (Remember that the laboratory may charge based on the number of composite subsamples, which may eliminate any composite sample discount.) The house has eight rooms that were treated, four of which are carpeted, and all of which have windows. Two of the four rooms selected for sampling have carpets; two do not. At a minimum, the clearance examiner should collect the following samples:

- One composite carpeted-floor sample, with one subsample from each of the two carpeted rooms in the room sample.
- One composite hard-floor sample, with one subsample from each of the two uncarpeted rooms in the room sample.
- One composite interior window sill sample, with one subsample collected from each of the four selected rooms.
- One composite window trough sample, with one subsample collected from each of the four selected rooms.
- One field blank sample for quality assurance.

This results in a total of four composite samples, plus one field blank, for a total of five analyses. If single-surface sampling had been completed under the recommendations in Table 15.1, nine samples would be analyzed (four rooms x two samples/room, + one field blank = nine samples/dwelling).

D. Securing the Clearance Area

The clearance area should not be occupied until the results of the laboratory analysis of dust samples have been received and the clearance examiner has found that the area has dust-lead levels below the clearance standard(s). It is especially important that children not enter the area. In most cases, closing and preferably locking of doors to the area and the use of yellow construction-area hazard tape should

be sufficient. In circumstances where young children are likely not to be deterred by such methods and experience indicates that lead hazards may be present, it is recommended that components with a possibility of hazards be covered with a layer of plastic sheeting.

FIGURE 15.9 Soil debris.

VII. Clearance Soil Sampling (optional)

A. Considerations for Sampling Soil Before the Work

It may be necessary to collect samples from soil that is not bare to determine if contamination has occurred. While it is generally preferable to sample bare soil, sampling covered soil is acceptable because the purpose of such sampling is not to identify a "lead-based paint hazard," but rather to determine if dust containment practices were adequate.

If soil lead levels after the work are below applicable soil lead hazard limits, the pre-abatement samples need not be analyzed. The hazard levels for soil are 400 µg/g for play areas and 1200 µg/g for the rest of the yard. If soil lead clearance levels are greater than or equal to the applicable limits, the baseline samples should be analyzed to determine if soil lead levels were already high before the work began. The decision to conduct soil treatment may depend on applicable regulations and/or the goals of the owner, contractor, or public agency.

B. Considerations for Sampling Soil After the Work

Neither EPA nor HUD requires any soil sampling as part of a clearance examination. If work that disturbs exterior paint has been performed, it is sufficient to conduct a visual examination to assure that there are no visible paint chips and other paint-related debris on the ground or on horizontal building surfaces (including exterior window sills) near the work surfaces. Horizontal building surfaces in outdoor living areas close to the work areas, such as porches or balconies, should also be free of visible dust as well as paint chips and paint-related debris.

Soil sampling, however, should be conducted if, contrary to the prohibitions of EPA and HUD regulations and the recommendations of these *Guidelines*, exterior paint was removed by abrasive blasting, power washing or large-scale power sanding without local HEPA exhaust and full containment.

There should be no visible paint chips, visible surface dust, debris or residue on the surface of the soil near the foundation before clearance soil samples are taken. Visible paint chips should be picked up with a vacuum or by hand before soil sampling. However, soil sampling near the foundations of dwellings is often complicated by the presence of paint chips embedded in or under the soil surface from previous repainting efforts. The hazard associated with these paint chips in the soil is difficult to assess since it is often not practical to sample all the different paint chips that may be present. Therefore, these paint chips should be considered a part of the soil. They should not be sampled preferentially or excluded when collecting or analyzing the soil. Laboratories should be instructed to disaggregate (force) paint chips through the soil sieve as part of the analytical process so that paint chips remain part of the soil matrix into which they are embedded.

Clearance soil sampling is typically conducted around the foundation of the house, although it is also important to collect samples in play areas that could have been contaminated as a result of the work. All soil samples should be composite samples. If only selected faces of the building were treated, the first composite sample's subsamples should come from the soil under those faces, with a second composite soil sample collected from any nearby play areas. In both cases, bare soil should be sampled preferentially. If the exterior work involved covering bare soil areas only, clearance soil samples are not needed; a visual examination is adequate. Protocols for soil sampling are provided in Appendix 13.3 of these *Guidelines*, or ASTM Standard E 1727-05, Standard Practice for Field Collection of Soil Samples for Lead Determination by Atomic Spectrometry Techniques (***www.astm.org/Standards/E1727.htm***), or the EPA report, *Residential Sampling for Lead: Protocols for Dust and Soil Sampling,* March 1995 (EPA 747R95001) (***www.ecy.wa.gov/programs/hwtr/demodebris/pages2/leadsample.html***).

Sampling replacement soil, mulch, and other similar material used to replace or cover soil-lead hazards is optional at clearance (see Figure 15.9). EPA soil abatement regulations require that the lead concentration in replacement soil must be no greater than 400 parts per million (ppm; µg/g). These *Guidelines* recommend a lead concentration of no greater than 200 ppm, if possible. This lower concentration is required after interim control work in housing covered by HUD's Lead Safe Housing regulation (24 CFR 35.1330(f)(3)(i)(C)), and is recommended by HUD for abatement work in housing covered by its regulation. In a soil abatement activity, the certified abatement supervisor or contractor is responsible for installing replacement soil with acceptable levels of lead. In non-abatement activities, the owner may wish to obtain assurance from the supplier or from the clearance examiner that lead levels are acceptable, but this is generally not necessary for mulch or bark that comes from trees or other vegetation. (Shredded wood from old houses is not recommended because it may be contaminated by lead-based paint.)

If exterior work on lead-based paint has been performed, the contractor, owner, or public agency may wish to document that the work did not contaminate soil surrounding the dwelling. If this optional testing is desired, baseline soil samples (i.e., samples taken before the work began) should have been collected but not necessarily analyzed until clearance soil samples have been collected, analyzed, and compared to clearance standards. Soil samples collected during risk assessments (if one was performed) can be used as baseline samples.

C. Multi-family Housing Properties with more than One Building

If a large multi-building complex (development) of multi-family housing has undergone similar lead hazard control work in several areas of the exterior or soil, random sampling of the soil around the buildings can be conducted using the sampling scheme for lead-based paint inspection (see Chapter 7). Soil should be sampled around each building that: (1) experienced exterior paint-disturbing work; and (2) contains a dwelling unit that would have been randomly selected under the procedure for unit sampling described in Chapter 7. The drawbacks of conducting random clearance sampling are the same for soil as for dust (see Section IV.B.2, above).

As with the single-building case, above, one composite soil sample should be collected around the perimeter of each building. If only selected faces of the building were treated, the samples should come from the soil under those faces. A second composite soil sample should be collected from any nearby play areas. In both cases, bare soil should be sampled preferentially.

VIII. Determining Specified Hazard Control Work was Done (optional)

If the client wishes, the report of the clearance examination may include a determination as to whether lead hazard control work on all interior and exterior surfaces to be treated was in fact done as specified. This option, which is one possible way for the owner to reduce liability, is not part of the standard clearance examination. It is normally the responsibility of the contractor performing the work or the construction manager. If desired by the client, it should be agreed to explicitly in advance. This function should be performed by a certified risk assessor or lead-based paint inspector. Sampling technicians are not trained to make this determination.

To do this, it is strongly recommended that, for most jobs, especially those involving abatement, the clearance examiner observe the work at critical phases, as well as at other times. In any event, it is essential that clearance examiners have full knowledge of the extent of the work, including the original scope and any change orders, and specifically which surfaces did not require treatment. The clearance examiner should have access to any risk assessment or paint inspection reports as well as the job scope of work or specifications and a report from the owner or contractor that the work has been completed. When paint removal and repainting or soil removal and covering are planned, verification of the removal of the lead hazards will be necessary prior to the completion of work.

Regulatory requirements:

- EPA requirements for abatement: When abatement of lead-based paint hazards is performed, EPA work practice standards require that a certified abatement supervisor be responsible for the job and that the supervisor prepare a report describing the abatement work that has been done and the results of the clearance tests. The owner may wish to ask a risk assessor or lead-based paint inspector to assist in monitoring the project and/or making a finding that the abatement was conducted in accordance with the specifications for the job as well as to perform the normal clearance examination.

- HUD requirements for interim controls in Federally-assisted housing: If the job is covered by HUD requirements for housing receiving Federal assistance or housing being sold by the Federal Government, HUD's Lead Safe Housing Rule requires that the owner or another designated party prepare a report that describes the hazard reduction or maintenance work that has been performed. In this case, the client may want the clearance examiner to assist in determining that the work is done as planned and to prepare the description of the work, or the client may prepare the description of the work. In either case, the clearance examiner must prepare the report on the results of the clearance examination.

- Lead-poisoning cases: In the case of a child with an elevated blood-lead level, local or State authorities may require that the treatment of all indicated surfaces be verified by a Government employee or certified third party, especially in cases where the abatement has been ordered by local authorities. In addition, for certain types of HUD housing assistance, HUD's Lead Safe Housing Rule requires environmental interventions when the children's blood lead level is sufficiently high. Clearance examiners should determine if the property they are evaluating has been treated as a result of a legal or regulatory proceeding. If so, the enforcement agency should be contacted to coordinate clearance procedures, prevent duplication of effort and, most important, ensure that the private clearance process is not inadvertently overstepping the bounds of the normal practices of the local health department or childhood lead-poisoning prevention program.

A report on work done should contain the following information:

- The address or location of the property or structures to which the report applies;
- The start and completion dates of the work;
- The name, address, and certification type and number of each firm or organization conducting the work, and the name(s) of supervisor(s) / certified renovator(s) assigned to the work;
- A detailed written description of the work, including the methods used, locations of exterior surfaces, interior rooms *and common areas*, and/*or* components where the work occurred, and (if applicable) any suggested monitoring of encapsulants or enclosures; and
- If soil hazards were controlled, a detailed description of the locations of the work and the methods used.

See Section X**,** below, for a list of information to be included in a report on the results of a clearance examination.

The following is guidance for determining completion of various types of lead hazard control work.

A. Paint Removal and Repainting

All surfaces where paint has been removed should be visually examined *prior to repainting*. If clearance is conducted after new paint is applied, it is often impossible to determine if the old paint was actually removed. Areas commonly overlooked during paint removal projects include the underside of interior window sills and handrails, backside of radiator ribs, the bottom edge of doors, the top of doorframes, and the back edge of shelving.

For both on-site and off-site paint removal, the clearance examiner or the owner should examine the bare surfaces to ensure that there is no visible residue (see Figure 15.10). If residue remains, the component should be cleaned prior to repainting or refinishing.

Wipe sampling and X-ray fluorescence (XRF) testing are not appropriate tools for determining the effectiveness of paint removal from a particular surface. Wipe sampling cannot dislodge any leaded-dust that may have been absorbed into the substrate during the removal process, nor can it remove paint that is still bonded to the substrate. Wipe sampling is appropriate for measurement of settled leaded-dust on floors, interior window sills, and window troughs. It is not appropriate to apply the settled leaded-dust clearance standard to stripped surfaces prior to repainting because the bare surface will be sealed with new paint, thus rendering the dust inaccessible. Appendix 1 describes how much lead-contaminated dust can remain on a surface (at least 35,000 µg/ft^2) before it would cause the newly applied paint to become lead-based paint (at 0.5 percent).

FIGURE 15.10 Surfaces that may have had paint stripped.

XRF testing of surfaces that have been stripped and repainted is not recommended. If the paint has been removed, removal should be assessed visually prior to repainting. Therefore the work specification should require the contractor to request visual clearance before paint or primer is applied. If for some reason it is not possible to visually determine that the paint has been removed, then XRF readings can be taken. The protocols described in Chapter 7 apply.

B. Building Component Removal and Replacement

If building components coated with lead-based paint were removed as a lead hazard control measure, the clearance examiner should have detailed knowledge of the scope of the activities so that actual removal can be verified. Each building component specified for replacement should also be examined to determine if it was overlooked during the lead hazard control work.

C. Enclosures

Complete installation of enclosure systems, such as new drywall, paneling, or siding, can be best evaluated by direct visual observation. The clearance examiner should determine that the mechanical fastening system used to hold the enclosure to the substrate is adequate. This is especially important for ceilings. All seams and edges in the enclosure should be sealed to provide a "dust-tight" (but not necessarily airtight) system (see Chapter 12 for further information on enclosures.)

D. Encapsulants

Another category of lead hazard control that can best be assessed visually is the application of encapsulants. Assuming that the encapsulant was properly selected for the surface undergoing treatment and that patch tests were conducted as recommended in Chapter 13, the clearance examiner can determine if the encapsulant is, in fact, present. Some States have requirements for the composition and/or application of encapsulants used in abatement.

E. Soil Treatments

Soil treatments, which typically consist of some form of covering or removal and/or replacement, can be assessed by visual observation to determine if the covering is present. For example, if sod or asphalt has been used as a soil covering, the clearance examiner should determine if all bare areas have been covered by sod or asphalt, as specified. See guidance on optional soil testing in Section VII, above.

F. Interim Controls

Visual examination of the wide variety of interim control measures consists of a confirmation that all lead-based paint (either suspected or identified through testing) within the scope of work is stabilized, and that any friction, impact, and other surfaces marked for treatment in the risk assessment report or project specifications have all been properly treated. No known or suspected lead-based paint within the scope of work should be in a deteriorated condition in a cleared dwelling or on the building exterior.

IX. Interpretation of Clearance Results, Recleaning, and Resampling

A. Visual Assessment Results

The clearance examiner should follow the procedures for visual assessment recommended in Section V.A, above.

B. Dust Sampling Results

Clearance dust standards are shown in Table 15.2 for single-surface wipe samples. Levels from single-surface wipe samples must be less than these levels to pass clearance. Clearance standards are shown in micrograms per square foot (μg/ft^2, micrograms of lead per square foot of sampled area, the common measurement unit for dust-lead clearance in the U.S.), and their equivalents in milligrams per square meter (mg/m^2, commonly used outside the U.S.).

Levels from a composite sample must be less than the following: the levels in Table 15.2 divided by one-half of the number of subsamples in the composite. Composite samples with two, three or four subsamples may be collected; the single-sample standards are divided by 1, 1.5 or 2, respectively, to determine the composite-sample standards. Clearance dust standards are shown in Table 15.3 for composite samples, in both μg/ft^2 and mg/m^2.

C. Recleaning and Resampling

1. Single-Surface Clearance Sampling

If single-surface wipe sample leaded dust levels equal or exceed those shown in Table 15.2, cleaning and sampling must be repeated until compliance is achieved. The clearance examiner should explain to the client exactly what surfaces must be recleaned in what rooms. The recleaning should be focused on those types of surfaces where the sampling results indicate that the previous round of cleaning was inadequate. For example, if floor leaded dust levels are above the standard, but interior window sills and window troughs are below the standard, only the floors need to be recleaned. Similarly, if single-surface samples fail in one room, then only that room and any rooms not sampled need to be recleaned. If composite samples fail, then ***all*** the surfaces the composite represents need to be recleaned (or resampled individually to determine which ones require recleaning). For example, consider the two examples shown in Tables 15.4 and 15.5.

Table 15.2 Clearance Dust Standards (Single-Surface Wipe Samples).

Surface	Dust-Lead Loadings Must Be Less Than[1]:	
Bare and carpeted floors	40 μg/ft^2	0.43 mg/m^2
Interior window sills	250 μg/ft^2	2.70 mg/m^2
Window troughs	400 μg/ft^2	4.30 mg/m^2

[1]Dust-lead standards are expressed in micrograms per square foot (μg/ft^2). To convert from μg/ft^2 to mg/m^2, multiply by 0.01076.

In Table 15.4 only the floors in rooms 1 and 2 require recleaning, assuming it is a four-room clearance area. The entire floor of each of these two rooms must be cleaned, not just the sampled spot. If there are unsampled rooms, the entire floors in those rooms would have to be recleaned also, or the floors in those rooms would have to be independently sampled, with any floor recleaning confined to rooms failing clearance. In either case, new floor dust samples would have to be taken to represent the rooms that were recleaned (if more than four rooms are recleaned, samples can be taken in a sample of rooms, as described in Section VI.C, above), and the samples must be analyzed and the results interpreted to determine whether the rooms pass clearance.

2. Composite Clearance Sampling

In Table 15.5, which is based on composite sampling with four subsamples in each composite, the clearance standard is one-half the standard for single-surface sampling; because one-half of 4 is 2, the single-surface sampling standard is divided by 2. Thus the standards applicable to this case are 20 µg/ft^2 for floors, 125 µg/ft^2 for interior window sills, and 200 µg/ft^2 for window troughs. This is shown in Table 15.3.

The floors and window sills are below their respective composite clearance standards, so they pass clearance. The window troughs, with dust-lead levels at 3695 µg/ft^2, is at or above the 200 µg/ft^2 composite clearance standard for four window trough subsamples (specifically, it exceeds the standard). Therefore all the window troughs should be recleaned in all four sampled rooms and any rooms not sampled. While the window troughs could conceivably be sampled individually to determine which ones require recleaning, it is likely to be more cost effective to simply reclean all of them. When cleaning troughs, the interior sills should also be cleaned, even if they were not originally contaminated, to minimize contamination of the sills during cleaning of the troughs.

Recleaning, if necessary, should be performed as soon as possible after receiving dust sampling results because dust lead on failed surfaces can migrate to other surfaces that successfully cleared.

Repeated sampling of the recleaned surfaces should be completed to ensure that the recleaning was sufficiently effective. (The clearance examiner and work supervisor may also want to recheck the completeness of the work.) In the second round of sampling, the clearance examiner should take wipe samples from specific floor, sill, or trough locations that are different from the specific wipe locations used in the initial round of sampling because the initial wipe cleaned the wiped surface. Also, the clearance examiner should consider taking one or more of the second wipe samples in unsampled rooms, if any, unless no work was done in those rooms.

If a surface fails clearance twice, the property owner should consider additional hazard control measures and/or further sealing of the surface prior to a second recleaning and a third round of clearance dust sampling.

Table 15.3 Clearance Dust Standards (Composite Wipe Samples)[1].

Surface / Number of subsamples	Dust-Lead Loadings Must Be Less Than[2]:	
Bare and carpeted floors		
2	40 µg/ft^2	0.43 mg/m^2
3	27 µg/ft^2	0.29 mg/m^2
4	20 µg/ft^2	0.22 mg/m^2
Interior window sills		
2	250 µg/ft^2	2.70 mg/m^2
3	167 µg/ft^2	1.79 mg/m^2
4	125 µg/ft^2	1.35 mg/m^2
Window troughs		
2	400 µg/ft^2	4.30 mg/m^2
3	267 µg/ft^2	2.87 mg/m^2
4	200 µg/ft^2	2.15 mg/m^2

[1] *The standard for a composite clearance dust sample is determined by dividing the single-surface standards, above, by one-half the number of subsamples in the composite sample. Thus, for a three-subsample composite, half of 3 equals 1.5, so the floor standard is 40 µg/ft^2 divided by 1.5, which equals 27 µg/ft^2.*

[2] *Dust-lead standards are expressed in micrograms per square foot (µg/ft^2). To convert from µg/ft^2 to mg/m^2, multiply by 0.01076.*

Table 15.4 Hypothetical Example of Single-Surface Clearance Dust Sampling Data.

Room	Floors (µg/ft^2)	Interior Sills (µg/ft^2)	Window Troughs (µg/ft^2)
1	230	50	190
2	375	65	285
3	28	70	214
4	31	40	305

Table 15.5 Hypothetical Example of Composite Clearance Dust Sampling Data.

Surface	Rooms Included in Composite	Leaded Dust (µg/ft^2)
Floors	1,2,3,4	18
Interior window sills	1,2,3,4	120
Window troughs	1,2,3,4	3695

X. Report Preparation

It is essential that the clearance examiner provide the client with a report documenting the results of the clearance. EPA specifies the required contents for an abatement *report* at 40 CFR 745.227(e)(10). HUD specifies the required report contents for *non-abatement projects in* units covered by the Lead Safe Housing Rule at 24 CFR *35.*1340(c). A checklist-based worksheet (Form 15.4) covers both requirements.

A. Summary Report

The report should include a one-page summary at the beginning of the report that is suitable for communication with residents, as well as a complete file of the visual assessment(s) form(s) and the dust sampling results form(s). Form 15.3, at the end of this chapter, provides a format for the summary report. The summary should contain the following information:

1. The address of the property where the clearance area is located.

2. A description of the area(s) covered by the clearance examination, including, as applicable, the specific dwelling units or common areas covered by the clearance and the specific rooms and exterior spaces.

3. The name and address of the client.

6. A summary of the results of the visual assessment. (The clearance examination should be stopped if the visual assessment fails.)

7. A summary of the results of the dust testing, which should include either:

   (a) A statement that no dust-lead hazards, as defined by the relevant EPA, State, Tribal or local standards, were found in the clearance area, and the date of the dust sampling; or

   (b) A statement that dust-lead hazards were found in the initial examination, identifying the date of the initial examination, the rooms and surfaces where dust-lead hazards were found, including any unsampled rooms and surfaces represented by the samples, and stating the dust-lead levels found.

8. If dust-lead hazards were found in a second or later round of dust sampling, a similar summary of the results of the dust testing should be provided for each round separately.

9. If the initial or later round of sampling found no dust-lead hazards, the report of a successful clearance examination should contain a statement that, based on visual assessment and dust sampling on the specific sampling date, no dust-lead hazards, as defined by the relevant EPA or State, Tribal or local standards, were found.

10. Identification of the clearance examiner(s), including the name of the clearance examiner, the name of the examiner's firm or organization, business address and telephone number, and the examiner's license or certification number.

11. Identification of the laboratory, including the name, address, telephone number, and NLLAP number.

12. The signature of the clearance examiner, with date.

The owner should use the summary of the report for, among other purposes: (1) promptly notifying current residents of the clearance results, as required by the HUD Lead Safe Housing Rule (if the property is covered by that rule), and (2) disclosing clearance dust-lead testing results and other lead reports, records and knowledge to prospective lessees (tenants) and purchasers of the property before they become obligated under a lease or sales contract, as required by Federal law under the HUD-EPA Lead-Based Paint Disclosure Rule (24 CFR 35, subpart A and 40 CFR 745, subpart F). The disclosure rule applies to almost all pre-1978 housing. See Appendix 6 for more information.

B. Regulatory Report Requirements

When abatement is performed, a certified supervisor or project designer must provide an abatement report that follows 40 CFR 745.227(e)(10) if EPA is operating the State or Tribal lead abatement certification program. In a State or Tribal area that has an EPA-authorized lead abatement certification program, the abatement report must follow that program's regulation.

When a non-abatement hazard reduction or maintenance activity requiring a clearance report is performed in housing covered by HUD's Lead Safe Housing Rule, the report must follow 24 CFR 35.1340(c) of that regulation.

Because HUD's report requirements were based on EPA's, the two reports are similar. The common and individual-agency requirements are outlined below; see the regulations for the exact wording of the requirements:

1. (Both) Start and completion dates of the abatement, lead hazard reduction or maintenance work.
2. (Both) The name and address of each certified firm conducting the work, and the name of each supervisor assigned to the project.
3. (HUD) The address of the residential property where the work was done, and, if only part of a multi-family property is affected, the specific dwelling units and common areas affected.
4. (EPA) The occupant protection plan.
5. (Both) The name, address, and signature of the clearance examiner.
6. (Both) The date(s) of clearance examination and testing.
7. (HUD) The results of the visual assessment for the presence of deteriorated paint and visible dust, debris, residue or paint chips.
8. (Both) The results of clearance testing, including the results of the analysis of dust samples, in µg/sq. ft., by location of sample.
9. (EPA) The results of all soil analyses (if applicable), in parts per million (µg/g), by location of sample.
10. (Both) The name of each NLLAP-recognized laboratory that conducted the analyses.
11. (HUD) The address and NLLAP identification number for each laboratory.
12. (Both) A detailed written description of the work, including the methods used, locations of exterior surfaces, interior rooms, common areas, and/or components where the hazard reduction activity occurred, and any suggested monitoring of encapsulants or enclosures.

13. (HUD) If soil hazards were reduced, a detailed description of the location(s) of the hazard reduction activity and the method(s) used.

Some States, Tribes or localities may have specific requirements or forms pertaining to clearance reports. Clearance examiners must comply with those requirements if they are more stringent or protective than the applicable federal requirements.

XI. Recordkeeping

A. Recordkeeping Responsibilities

Three parties should maintain records of all abatement, interim control, risk assessment, inspection, and clearance results, and resident notifications and disclosure forms, with which they have been involved:

- Property owner.
- Contractor.
- Clearance examiner.

See Section X.A, above, regarding the owner's responsibility for clearance report record retention and disclosure / notification under the Lead Disclosure Rule and, if applicable, the Lead Safe Housing Rule. (See Appendix 6 for more information on record retention, disclosure, and notification.) Some jurisdictions may also require submission of such records to an enforcement agency or a lead-safe housing registry.

B. Record Content

The records should include all laboratory results, quality control/quality assurance procedures, dates of both visual examination and environmental sampling, completed forms, and appropriate identifiers for the property – the owner, inspector, contractor, and resident(s).

C. Length of Retention

Records of all clearance testing should be kept for no less than 3 years but preferably for the duration of the life of the building, since it is to the benefit of the owners to retain this information. See Appendix 6 for more information. Some states require a longer period of record retention of (e.g., New Jersey requires that lead records for multi-family target housing be retained for at least 5 years).

Form 15.1 Visual Assessment – Lead Hazard Clearance Examination.

Property address: _____ Page _____ of _____

Name of client: _____

Name of clearance examiner: _____ Certification No.: _____ Exp. date: _____

Date of visual assessment: ____ / ____ / ____ Repeat visual assessment? ❑ Yes ❑ No

This form covers: ❑ Dwelling units. (Specifiy which units) _____

❑ Common areas. (Specify which areas) _____

❑ Exterior areas/outbuildings. (Specify) _____

Any deteriorated paint, visible dust, paint chips, or paint-related debris observed? ❑ Yes ❑ No

If "Yes," record observations in the table below:

Room, Area, or Side of Building (if exterior)	Building Component, or Other Surface (such as ground or vegetation)	Additional Notes on Specific Location	Description of Problem (i.e., deteriorated paint, visible dust, paint chips, or paint-related debris)

Notes (include any explanations by the client of why deteriorated paint has not been repiared; also include any instructions to client regarding further cleaning):

_____

_____

_____

_____

_____

_____

Signature of clearance examiner: _____

Form 15.2 Field Sampling Form for Dust-Lead Hazard Clearance Examination (single-surface sampling).

Property address: _____ Apt. no. or common area: _____ Page _____ of _____

Name of property owner: _____ Name of clearance examiner: _____

Certification #: _____ Exp. date: _____

Sample Number	Room (if possible, use room names used by the owner or resident)	Surface Type (hard floor, carpeted floor, interior window sill, or window trough)	Exact Location of Wipe Sample	Dimensions of Sample Area (inches x inches)[1]	Area of Sample (sq. ft.[2])	Results of Lab Analysis		Pass[3] (less than standard) or Fail (equal or greater than st'd.)
						µg of Pb in Sample	µg/ft[2]	
				____ x ____				
				____ x ____				
				____ x ____				
				____ x ____				
				____ x ____				
				____ x ____				
				____ x ____				
				____ x ____				
				____ x ____				
				____ x ____				
				____ x ____				
				____ x ____				

[1] Measure to the nearest 1/8th or 1/10th of an inch. [1/8 = 0.125; 2/8 = 0.25; 3/8 = 0.375; 4/8 = 0.5; 5/8 = 0.625; 6/8 = 0.75; 7/8 = 0.875]

[2] Calculate area in square feet as follows: Calculate square inches, then divide by 144.

[3] EPA standard: 40 µg/sq. ft. for floors; 250 µg/sq. ft. for interior window sills; and 400 µg/sq. ft. for window troughs.

Total number of samples on this page: _____ Date of sample collection: _____/_____/_____ Date shipped to lab: _____/_____ / ____

Shipped by: _____ Received by: _____ Reviewed by: _____
(signature) (signature and date) (signature and date)

Date results reported by lab: _____/_____/_____ Reviewed by: _____

Form 15.3 Lead Hazard Clearance Report – Completed Example

The following report is a made-up example of a clearance report from a small , non-abatement, rehabilitation job (less than $5,000) that involved window replacements in the small bedroom and kitchen of a single-family home that is available for rent. The clearance report covers clearance of the worksite.

Home Environmental Inspection Services, Inc.

345 Hammond Road
East Chicago, IN 12345
123-123-1235
345-789-5678 (fax)

Firm certification number: IN 78787

Clearance Report

General Information

Date of clearance examination:	8/5/2010
Clearance Examiner:	Joe Smith
Certification Category:	Risk Assessor
Certification Number:	IN 77777
Property address:	78 East Main St., Apt. A Hammond, IN 89898
Client name:	Sally Jones
Client address:	80 East Main St. Hammond, IN 89898
Laboratory:	Analysis Services, Inc.
Address:	990 45th St., Suite 500 Gary, IN 44444
Telephone number:	222-222-2222
NLLAP number:	IN 999999

Summary of Clearance Results

Dust above Federal standards was found in the following areas:

Location	Surface	Fg lead/ft^2
Small bedroom	Side facing window (C-1) – windowsill	600
Small bedroom	Floor	200
Kitchen	Window above sink (A-1) – windowsill	525

Signature: Joe Smith

Date: 8/6/2010

Summary of Hazard Reduction Activities

Name of firm	ABC Renovations
Address of Firm	123 Main Street East Chicago, IN 12345
Abatement or RRP Firm Certification Number	IN45789
Name of Certified Abatement Supervisor / Certified Renovator	John Brown #1634
Supervisor / Renovator Certification Number	IN1634
Start and completion date of hazard reduction or abatement activity.	8/1/2010 to 8/5/2010

Description of Hazard Reduction Activities and Areas Addressed:

Location	Activity
Kitchen	Replaced A-1 window with new, vinyl-clad window
2nd Floor Small Bedroom	Replaced C-1 and C-2 windows with new, vinyl-clad windows
Description of Work	The certified renovator was present on the job site when work was being performed. Workers used lead-safe work practices. Plastic sheeting covered a 8-foot area on the ground outside under the windows being replaced and on the floor inside. Signs were posted at the doors to the bedroom and kitchen. Occupants were not allowed in the kitchen and bedroom and the outside work area during this activity. The window frame was misted prior to tear-out. After removal, workers wrapped the old windows in plastic sheeting and picked up debris on the plastic immediately and bagged it. The plastic sheeting was carefully gathered up and bagged for disposal. Workers replaced their disposable booties when leaving the work area for lunch and breaks. Respirators were not necessary. The new windows were installed and, in accordance with the contract, a clearance examination was requested.

On-Going Lead-Based Paint Monitoring Requirements:

HOME rental assistance is not provided to this unit, so ongoing LBP maintenance is not required.

VISUAL EVALUATION RESULTS FORM

Date of clearance:	8/5/2010
Clearance Technician:	Joe Smith
Client:	Sally Jones
Property address:	78 East Main St., Apt. A Hammond, IN 89898

Visual Assessment of the Work Area

Work Area	Deteriorated Paint	Debris	Visible Dust	Notes	Pass/Fail
Small bedroom					Pass
Kitchen					Pass
First floor hallway					Pass
Staircase					Pass
Second floor hallway					Pass
Exterior soil under kitchen window					Pass
Exterior soil under bedroom window					Pass

DUST SAMPLING RESULTS FORM

Date of clearance:	8/5/2010
Clearance Technician:	Joe Smith
Client:	Sally Jones
Property address:	78 East Main St., Apt. A Hammond, IN 89898

Sample #	Location	Surface	Dimensions of sample area	µg Lead/ ft^2	Pass/Fail
1-2	Upstairs small bedroom	Front facing window (C-2)- windowsill	4″ x 18″	17	Pass
1-3	Upstairs small bedroom	Floor under C-1 window	12″ x 12″	200	Fail
1-4	Upstairs small bedroom	Side facing window (C-1)- windowsill	4″ x 18″	600	Fail
2-1	Second floor	Floor	12″ x 12″	35	Pass
3-1	Staircase	Floor	12″ x 12″	30	Pass
4-1	Kitchen	Floor under A-1 window	12″ x 12″	12	Pass
4-2	Kitchen	Window above sink (A-1)- windowsill	4″ x 18″	525	Fail
5-1	First floor	Floor	12″ x 12″	30	Pass

Understanding Your Report

1. The Summary Results section lists all of the areas that failed the clearance examination. The areas represented by the sample needs to be re-cleaned and re-tested to see if the cleaning removed the contaminated dust. Deteriorated painted surfaces should be repaired using interim controls or abatement techniques.

   For written information on how to address lead hazards, call the National Lead Information Center Clearinghouse at 1-800-424-Lead (1-800-424-5323). You may consider hiring a risk assessor to evaluate lead hazards in your home and recommend a lead hazard control plan. Risk assessors may be found from the EPA Regional Lead Coordinator, if the property is in a State for which EPA operates the lead certification program, through ***www.epa.gov/lead/pubs/leadoff1.htm***, or if the property is in a State or Tribal Area which does operate the lead certification program, through ***www.epa.gov/lead/pubs/traincert.htm***.

2. The laboratory result forms attached to the report list all of the areas sampled inside and outside the dwelling and the laboratory analysis results for each sample.

3. The dust sampling results are expressed in micrograms per square foot (µg/ft^2); soil samples are expressed in micrograms per gram (µg/g).

4. Areas that failed the clearance examination showed lead levels in dust at or above Federal or state standards. The standards that were used for during this clearance examination are:

HUD/EPA Clearance Standards for Lead in Dust

Carpeted and Uncarpeted Floors: 40 µg/ft^2
Interior window sill (stool): 250 µg/ft^2
Window trough: 400 µg/ft^2

Form 15.4 Clearance Report Review Worksheet

You may use the worksheet for a project that requires clearance, or when the owner chooses to have clearance, to document clearance was achieved and the clearance report is complete.

Property Address:_____ Date:_____

Name of Reviewer:_____ Title:_____

Question	Yes	No	Notes
The clearance examiner's report must include the information in items number 1 though 6, and 13a. See below on instructions for Items 7-12. Item 12 may be required.			
1. Property address and specific unit or common areas identified.			
2. Name, address, signature and certification number of each person involved in the clearance examinations.			
3. Name and NLLAP identification number of each laboratory conducting an analysis.			
4. Dates of clearance examination.			
5. Results of visual assessment for the presence of deteriorated paint and visible dust, debris, residue or paint chips.			
6. Results of all analyses (dust wipes in micrograms per square feet (μg/ft²); soil in parts per million) by location of sample, as well as information about the laboratory.			
The clearance report must also include information on lead hazard reduction (Items 7-11). Indicate the source of the information (the designated party or contractor may have to provide this information) if the clearance examiner was not responsible for the information. ***Item 12 is required for abatement and optional for other projects****.*			
7. Name and address of each firm and supervisor involved in the lead hazard reduction activity.			
8. Start and completion dates of lead hazard reduction activity.			
9. Detailed *written* description of the lead hazard reduction activity, including the methods used.			
10. Locations of exterior surfaces, interior rooms, common areas and/or components where the hazard reduction activity occurred.			
11. Any suggested monitoring requirements. (If none, enter "N/A".)			
12. Occupant protection plan (*required* for **abatement** project, optional otherwise; if not required or done, enter "N/A").			
Evaluate the results of the report.			
13. Did each unit *or common area* pass clearance?			

Other Notes:

_____

_____

Form 15.5 Example of Filled-In Clearance Report Review Worksheet

Property Address: 78 East Main St., Apt. A, Hammond, IN 89898 Date: 8/8/2010

Name of Reviewer: John Jones Title: Construction Specialist, City of Hammond, IN

Question	Yes	No	Notes
The clearance examiner's report must include the information in items number 1 though 6, and 13a. See below on instructions for Items 7-12. Item 12 may be required.			
1. Property address and specific unit or common areas identified.	***x***		
2. Name, address, signature and certification number of each person involved in the clearance examinations.	***x***		
3. Name and identification number of each laboratory conducting an analysis.	***x***		
4. Dates of clearance examination.	***x***		
5. Results of visual assessment for the presence of deteriorated paint and visible dust, debris, residue or paint chips.	***x***		
6. Results of all analyses (dust wipes in micrograms per square feet (μg/ft²); soil in parts per million) by location of sample, as well as information about the laboratory.	***x***		
The clearance report must also include information on lead hazard reduction (Items 7-11). Indicate the source of the information (the designated party or contractor may have to provide this information) if the clearance examiner was not responsible for the information. ***Item 12 is required for abatement and optional for other projects****.*			
7. Name and address of each firm and supervisor involved in the lead hazard reduction activity.	***x***		
8. Start and completion dates of lead hazard reduction activity.	***x***		
9. Detailed *written* description of the lead hazard reduction activity, including the methods used.	***x***		
10. Locations of exterior surfaces, interior rooms, common areas and/or components where the hazard reduction activity occurred.	***x***		
11. Any suggested monitoring requirements. (If none, enter "N/A".)	***N/A***		
12. Occupant protection plan (*required* for **abatement** project, optional otherwise; if not required or done, enter "N/A").	***N/A***		
Evaluate the results of the report.			
13. Did each unit *or common area* pass clearance?	***x***		

Other Notes:

HOME rental assistance is not provided to this unit, so ongoing LBP maintenance is not required.

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