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Limited Visual Assessment and Lead-based Paint Inspection

917 W Colfax, South Bend, IN 46601

Homeowner/Tenant: South Bend Heritage

Inspection Date: March 25, 2022

Inspection conducted by:

William C. Center
IN Lead Risk Assessor, License #IND000368
Certificate Expiration Date: 10/14/2024



This limited inspection was performed in compliance with all federal and state regulations regarding lead-based paint. Some painted surfaces identified as *negative* for lead-based paint in this report may contain levels of lead below 1.0 mg/cm², which if turned into dust by abrasion, such as scraping or sanding, could create lead dust or lead-contaminated soil hazards. In addition, lead-based paint may be present underneath siding, paneling, flooring, or other materials, and may not have been accessible for testing during the inspection. Aggressive work methods that produce excessive dust should be avoided with any painted surface.

Federal law (24 CFR part 35 and 40 CFR part 745) requires sellers and lessors of residential units constructed prior to 1978, except housing for the elderly or persons with disabilities (unless any child who is less than six year of age resides or is expected to reside in such housing) or any zero-bedroom dwelling to disclose and provide a copy of this report to new purchasers or lessees before they become obligated under a lease or sale contract. Property owners and sellers are also required to distribute an educational pamphlet approved by the United States Environmental Protection Agency and include standard warning language in leases or sales contracts to ensure that parents have the information they need to protect children from lead-based paint hazards.

Table of Contents

I	Executive Summary
II	Scope of Inspection
	A. Introduction
	B. Building Background and Site Description
	C. Training
	D. Equipment
	E. Inspection Company
	F. Methods
	G. Findings
III	Disclosure Responsibility and Disclaimer
	- APPENDICES -
IV	Complete XRF Results
V	Diagrams
VI	License and Certification
VII	Photograph Log
VIII	Glossary
IX	Performance Characteristic Sheet for XRF

I Executive Summary

William C. Center was authorized by South Bend Heritage to perform a limited lead-based paint (LBP) inspection of a single-family home located at **917 W Colfax, South Bend, IN 46601**. The tenant/homeowner of this property is South Bend Heritage. Mr. Center tested all painted and/or finished components within the limited area requested by South Bend Heritage according to the specifications described in the protocols for lead-based paint testing in the HUD Guidelines Chapter 7 (revised 1997) and all applicable federal, state, and local regulations.

Mr. Center's testing protocol involved XRF testing, as well as a surface-by-surface visual inspection of all painted surfaces throughout the limited area to determine the condition of painted surfaces/components, whether intact (good) or in deteriorated condition (i.e. above the de minimis level), and to determine which of those surfaces are positive for lead-based paint. All accessible, painted or coated building components (that potentially contain lead-based paint) were tested using XRF analysis. A complete list of the collected data is in Appendix V.

Mr. Center has determined that there is deteriorated lead-based paint within the testing area, and lead hazard reduction activities will be required. Lead-based paint was identified in the following surfaces:

Location of Positive, Deteriorated Lead-based Paint	Approximate Square Footage	Quantity
Porch A upper siding décor (assumed positive) (red)	7	2
Porch A upper trim (assumed positive) (tan)	7	2
Porch A ceiling	200	
Porch A beams ABD	120	
Porch A soffit and fascia ABD	120	
Exterior ABCD siding	6000	
Exterior ABCD corner boards	20	11
Exterior ABCD window casings and sills	5	27
Exterior BD window sashes and casings	5	2
Exterior ABD window and components (attic) (assumed positive) (red and tan)	6	3
Exterior A (B) door header	1	1
Exterior A (a) door header and threshold	2	1
Exterior C (1-3) door headers	1	3
Exterior ABCD soffit, fascia, and upper trim (assumed positive) (tan)	500	

****Note: There are boards on siding that were replaced in areas that are negative but other areas are positive**.**

Location of Additional Positive Components in Good Condition (Intact)
N/A

Please note: The following information is provided to assist you in determining which walls or "sides" are referenced throughout the report. Wall "A" in each room is the wall where the front entrance door opening is located (or aligned with the street). Going clockwise and facing wall "A" from the street, wall "B" will always be to your left, wall "C" directly to the rear, and wall "D" to the right.

Mr. Center tested a total of **sixty-six (66) surfaces via XRF analysis with six (6) calibration readings. Thirty-two (32) readings were found to contain lead at levels above or equal to the regulatory level of 1.0 mg/cm².** A complete list of the collected data is in Appendix V. The results, assessments and findings stated in this report are representative of the conditions observed in this property at the time of the inspection.

Lead inspections determine the presence of lead in paint and other possible lead-based and contaminated areas. This inspection measures lead in both deteriorated (poor) and intact (good) paint surfaces. The procedure involves collecting readings from representative surfaces throughout the testing area or room. The most common primary analytical method for detecting lead in paint is XRF testing. The XRF instrument is used because of its demonstrated ability to accurately determine the amount of lead that is present without disturbing the painted surfaces, as well as its quick testing speed and relatively low cost per sample. **This inspection does not determine the presence of lead-based paint hazards. It only serves to identify areas of lead in paint. Treating the above-mentioned deteriorated lead-based paint areas may not remove all lead-related hazards from this property. For hazard identification, please contact a licensed Lead Risk Assessor to perform a Lead Risk Assessment on this property.**

II Scope of Inspection

A. Introduction

The purpose of this limited inspection is to determine the location of lead-based paint on painted components within the specified testing area. This limited lead-based paint inspection was performed in accordance with all federal, state and local regulations, using procedures established by HUD. Any paint not tested during the course of this inspection, such as painted surfaces that are hidden behind paneling, siding, etc., should be regarded as potentially containing lead-based paint and should be treated as such.

Mr. Center was authorized by South Bend Heritage to perform limited lead-based paint testing of **917 W Colfax, South Bend, IN 46601** to determine the possible presence, condition, location, and amount of lead paint. The specific testing area was: **Exterior**. The testing was conducted on **March 25, 2022**.

B. Building Background and Site Description

The property located at **917 W Colfax, South Bend, IN 46601** is a multi-family home (3 units). No written permission was required to access the property. The property was occupied at the time of the inspection. The property is a 2-story residence with an attic and basement built in 1895. The exterior of the house is wood. The windows are wood and vinyl. A photo of the subject location is found below.



917 W Colfax, South Bend, IN 46601

C. Training

All inspectors utilized by Greentree have EPA/State licensure and are licensed Lead Risk Assessors who have passed the "HUD Visual Assessment Course." All technicians utilized by Greentree have also been trained in the use, calibration and maintenance of the XRF equipment they currently use, along with necessary principles of radiation safety.

D. Equipment

During this limited inspection, direct-read analysis for lead content of painted surfaces was performed using a Heuresis Pb200i XRF lead paint analyzer, serial #2034. This instrument requires no substrate correction. XRF technology utilizes low level radiation to induce measurable readings of the quantity of lead (Pb) atoms present within a painted surface. The analyzer then displays the results in milligrams of lead per square centimeter of surface area tested (mg/cm²), and this is able to determine if lead-based

paint is present. With XRF technology, it is possible that readings on a surface may detect lead underneath or on the back side of the tested surface (i.e. paint under siding, aluminum trim, or on the back side of a window sash).

E. Inspection Company

The limited inspection was performed by William C. Center (Indiana license #IND000368), who is employed by Greentree Environmental Services, Inc., 5287 Central Avenue, Portage, IN 46368, telephone number (888) 584-5323. Mr. Center can be reached through this phone number.

F. Methods

The calibration of the Pb200i XRF is done in accordance with the Performance Characteristic Sheet (PCS) for this instrument. These XRF instruments are calibrated using a calibration standard block of known lead content. Three calibration readings are taken before and after each property is tested to ensure manufacturer's standards are met. If the inspection is longer than four hours, a set of three calibration readings must be taken before the four hours expire, and then an additional three calibration readings must be taken at the end of the inspection. If, for any reason, the instrument is not maintaining a consistent calibration reading within the manufacturer's standards for performance on the calibration block supplied by the manufacturer, manufacturer's recommendations are used to bring the instrument into calibration. If the instrument cannot be brought back into calibration, it is taken off the site and sent back to the manufacturer for repair and/or re-calibration.

According to HUD guidelines, certain components commonly have the same paint history, and are therefore grouped together within each individual room equivalent and are then tested with a single test reading. Similar components that have different substrates cannot be grouped together. Walls and ceilings are tested individually due to their large surface areas.

When evaluating this report, it is assumed (per Chapter 7 HUD guidelines) that if one testing combination (ex: Bathroom/window sill/wood) in an interior or exterior room equivalent is found to be positive for lead-based paint, then all other similar testing combinations in that room equivalent are also assumed to be positive for lead-based paint. The exception to this assumption is when 100% of the similar testing combinations in the room equivalent are tested. In addition, all testing combinations not tested are assumed to be positive for lead-based paint.

No destructive testing was performed.

G. Findings

917 W Colfax, South Bend, IN 46601

This property is a single-family home, so no extrapolations were required because Chapter 7 Single-family Testing Rules were followed.

Mr. Center tested a total of **sixty-six (66) surfaces via XRF analysis with six (6) calibration readings. Thirty-two (32) readings were found to contain lead at levels above or equal to the regulatory level of 1.0 mg/cm².**

The direct-read data collected from the XRF analysis representing areas that are positive for lead-based paint is listed below:

#	Surface	Substrate	Side	Condition of Paint	Room	Color	Floor	PbC	Result
7	Porch Beam	Wood	A	DETERIORATED	Porch A	Tan		29	Positive
8	Porch Ceiling	Wood	A	DETERIORATED	Porch A	Tan		25.2	Positive
12	Corner Board	Wood	A	DETERIORATED	Exterior House	Tan		23.8	Positive
13	Win. Casing	Wood	A	DETERIORATED	Exterior House	Tan		23.7	Positive
14	Win. Sill-Stool	Wood	A	DETERIORATED	Exterior House	Tan		24.8	Positive
17	Door Header	Wood	A	DETERIORATED	Exterior House	Tan		25.1	Positive
18	Door Header	Wood	A	DETERIORATED	Exterior House	Tan		27.3	Positive
21	Door Threshold	Wood	A	DETERIORATED	Exterior House	Tan		4.3	Positive
22	Siding	Wood	A	DETERIORATED	Exterior House	Green		20	Positive
23	Siding	Wood	A	DETERIORATED	Exterior House	Green		17.1	Positive
24	Siding	Wood	B	DETERIORATED	Exterior House	Green		16	Positive
25	Corner Board	Wood	B	DETERIORATED	Exterior House	Tan		25.8	Positive
26	Win. Casing	Wood	B	DETERIORATED	Exterior House	Tan		24.7	Positive
27	Win. Sill-Stool	Wood	B	DETERIORATED	Exterior House	Tan		1.7	Positive
28	Win. Casing	Wood	B	DETERIORATED	Exterior House	Tan		23	Positive
29	Win. Sash	Wood	B	DETERIORATED	Exterior House	Tan		19.6	Positive
32	Siding	Wood	B	DETERIORATED	Exterior House	Green		18.6	Positive
38	Siding	Wood	C	DETERIORATED	Exterior House	Green		6.7	Positive
39	Win. Casing	Wood	C	DETERIORATED	Exterior House	Tan		20	Positive
40	Win. Sill-Stool	Wood	C	DETERIORATED	Exterior House	Tan		2.7	Positive
42	Corner Board	Wood	C	DETERIORATED	Exterior House	Tan		22	Positive
44	Door Header	Wood	C	DETERIORATED	Exterior House	Tan		19.9	Positive
45	Door Header	Wood	C	DETERIORATED	Exterior House	Tan		21.4	Positive
49	Door Header	Wood	C	DETERIORATED	Exterior House	Tan		9.5	Positive
60	Siding	Wood	D	DETERIORATED	Exterior House	Green		13.3	Positive
63	Win. Casing	Wood	D	DETERIORATED	Exterior House	Tan		5.7	Positive
64	Win. Sill-Stool	Wood	D	DETERIORATED	Exterior House	Tan		9.8	Positive
65	Corner Board	Wood	D	DETERIORATED	Exterior House	Tan		22.1	Positive
66	Win. Casing	Wood	D	DETERIORATED	Exterior House	Tan		24.4	Positive
67	Win. Sash	Wood	D	DETERIORATED	Exterior House	Tan		21.8	Positive
68	Soffit	Wood	A	DETERIORATED	Porch A	Tan		26	Positive
69	Fascia	Wood	A	DETERIORATED	Porch A	Tan		26.2	Positive

III Disclosure Responsibility and Disclaimer

Disclosure Responsibility

A copy of this report must be provided to new lessees (tenants) and purchasers of this property under Federal Law (24 CFR Part 35 and 40 CFR Part 745) before they become obligated under a lease or sales contract. The complete report must also be provided to new purchasers and it must be made available to new tenants. Landlords (lessors) and sellers are also required to distribute an educational pamphlet and include standard warning language in their leases or sales contracts to ensure that parents have the information they need to protect their children from lead-based paint hazards.

Disclaimer

This is licensed Lead Risk Assessor William C. Center's report of a visual survey, and X-ray fluorescence (XRF) analysis of the readily accessible areas of the limited area and tested components. The presence or absence of lead-based paint or lead-based paint hazards applies only to the tested or assessed surfaces on the date of the field visit, and it should be understood that conditions noted within this report were accurate at the time of the inspection and in no way reflect the conditions at the property after the date of the inspection. No other environmental concerns were addressed during this inspection.

Per Single-family Housing Lead-Evaluation Protocol 7.0, every effort was made to test all areas with painted components within the limited testing area. Soil and wipe sampling were not performed. Rather, materials were grouped homogeneously based on date of application, color, type of structure, etc. Samples of each homogenous group were then taken and analyzed for lead content via XRF. Non-painted components, such as ceramic tile and vinyl baseboards, were not tested. Factory finish components or paneled areas, such as walls, vent covers, countertops, exhaust hood covers, mailboxes, sinks, electrical panels, closet clothing bars, and light fixtures, were not tested unless they were painted.

This limited inspection was done in accordance with Lead Safe Housing Rule 24 CFR Part 35 subpart F June 21, 2004, as amended. The sample results are presented in Appendix V. The surface conditions ranged from intact to deteriorated at the time of the inspection.

If any construction or modernization work is done on the premises, this report should be given to the contractors as well as the tenants.

IV Complete XRF Results

There are ten columns in the XRF table. The interpretation of each column is as follows:

Column 1 - Reading Number (#): This is simply the shot number that was taken during the inspection. On occasion, the number may not start at "1" if XRF shots from previous inspections are still in the XRF device.

Column 2 - Surface: This column identifies the surface that was tested. Some examples are doors, door trim, walls, ceiling, exterior siding, etc.

Column 3 - Substrate: This column defines what material the paint was applied to. Substrates are most commonly plaster or wood but could be other material such as metal. Also listed in this column is the XRF calibration. The XRF must be calibrated before inspection and at the end of the inspection. Additionally, the XRF needs to be calibrated every 4 hours if the inspection exceeds 4 hours.

Column 4 - Side: This column determines where the item being tested is located in the room. Side A is always the side of the property that faces the street. Then, proceeding in a clockwise direction and facing side A from the street, the adjacent sides are labeled B, C and D. Sides A, B, C and D are identified in the floor plans located in Section VII.

Column 5 - Condition: This column identifies the condition of the paint on the surface being tested. Terms such as intact (good) and deteriorated (poor) are used to describe the paint condition.

Column 6 - Room: This column identifies the room where XRF testing was performed. Rooms are always identified by a number, except for kitchens, bathrooms, or other clearly identifiable rooms. Numbers are used because room usage may change (i.e. a bedroom may become an office).

Column 7 - Color: This is the color of the surface of the component being tested with the XRF.

Column 8 - Floor: This simply corresponds to the floor of the building.

Column 9 – PbC: This column quantifies the amount of lead identified on the painted surface.

Column 10 - Results: This column indicates whether the paint tested positive or negative for the presence of lead.

South Bend Heritage
917 W Colfax, South Bend, IN 46601

#	Surface	Substrate	Side	Condition of Paint	Room	Color	Floor	PbC	Result
1	CALIBRATE					Green		1	Positive
2	CALIBRATE					Green		1	Positive
3	CALIBRATE					Green		1.1	Positive
4	Railing	Wood	A	DETERIORATED	Porch A	Tan		0	Negative
5	Floor	Wood	A	DETERIORATED	Porch A	Brown		0.2	Negative
6	Porch Column	Wood	A	DETERIORATED	Porch A	Tan		0.3	Negative
7	Porch Beam	Wood	A	DETERIORATED	Porch A	Tan		29	Positive
8	Porch Ceiling	Wood	A	DETERIORATED	Porch A	Tan		25.2	Positive
9	Railing	Wood	A	DETERIORATED	Porch A	Tan		0	Negative
10	Porch Apron	Wood	A	DETERIORATED	Porch A	Green		0	Negative
11	Porch Skirting	Wood	A	DETERIORATED	Porch A	Tan		0	Negative
12	Corner Board	Wood	A	DETERIORATED	Exterior House	Tan		23.8	Positive
13	Win. Casing	Wood	A	DETERIORATED	Exterior House	Tan		23.7	Positive
14	Win. Sill-Stool	Wood	A	DETERIORATED	Exterior House	Tan		24.8	Positive
15	Door Casing	Wood	A	DETERIORATED	Exterior House	Tan		0	Negative
16	Door Jamb	Wood	A	DETERIORATED	Exterior House	Tan		0	Negative
17	Door Header	Wood	A	DETERIORATED	Exterior House	Tan		25.1	Positive
18	Door Header	Wood	A	DETERIORATED	Exterior House	Tan		27.3	Positive
19	Door Casing	Wood	A	DETERIORATED	Exterior House	Tan		0	Negative
20	Door Jamb	Wood	A	DETERIORATED	Exterior House	Tan		0	Negative
21	Door Threshold	Wood	A	DETERIORATED	Exterior House	Tan		4.3	Positive
22	Siding	Wood	A	DETERIORATED	Exterior House	Green		20	Positive
23	Siding	Wood	A	DETERIORATED	Exterior House	Green		17.1	Positive
24	Siding	Wood	B	DETERIORATED	Exterior House	Green		16	Positive
25	Corner Board	Wood	B	DETERIORATED	Exterior House	Tan		25.8	Positive
26	Win. Casing	Wood	B	DETERIORATED	Exterior House	Tan		24.7	Positive
27	Win. Sill-Stool	Wood	B	DETERIORATED	Exterior House	Tan		1.7	Positive
28	Win. Casing	Wood	B	DETERIORATED	Exterior House	Tan		23	Positive
29	Win. Sash	Wood	B	DETERIORATED	Exterior House	Tan		19.6	Positive
30	Foundation	Brick	B	DETERIORATED	Exterior House	Brown		0.5	Negative
31	Foundation	Cinderblock	B	DETERIORATED	Exterior House	Brown		0	Negative
32	Siding	Wood	B	DETERIORATED	Exterior House	Green		18.6	Positive
33	Siding	Wood	B	DETERIORATED	Exterior House	Green		0	Negative
34	Siding	Wood	C	DETERIORATED	Exterior House	Green		0	Negative
35	Siding	Wood	C	DETERIORATED	Exterior House	Green		0	Negative
36	Siding	Wood	C	DETERIORATED	Exterior House	Green		0	Negative
37	Corner Board	Wood	C	DETERIORATED	Exterior House	Tan		0	Negative
38	Siding	Wood	C	DETERIORATED	Exterior House	Green		6.7	Positive
39	Win. Casing	Wood	C	DETERIORATED	Exterior House	Tan		20	Positive
40	Win. Sill-Stool	Wood	C	DETERIORATED	Exterior House	Tan		2.7	Positive
41	Foundation	Brick	C	DETERIORATED	Exterior House	Brown		0.7	Negative
42	Corner Board	Wood	C	DETERIORATED	Exterior House	Tan		22	Positive
43	Door Casing	Wood	C	DETERIORATED	Exterior House	Tan		0	Negative

#	Surface	Substrate	Side	Condition of Paint	Room	Color	Floor	PbC	Result
44	Door Header	Wood	C	DETERIORATED	Exterior House	Tan		19.9	Positive
45	Door Header	Wood	C	DETERIORATED	Exterior House	Tan		21.4	Positive
46	Door Casing	Wood	C	DETERIORATED	Exterior House	Tan		0	Negative
47	Door Jamb	Wood	C	DETERIORATED	Exterior House	Tan		0.1	Negative
48	Door Dormer Wn.	Wood	C	DETERIORATED	Exterior House	Tan		0	Negative
49	Door Header	Wood	C	DETERIORATED	Exterior House	Tan		9.5	Positive
50	Porch Apron	Wood	C	DETERIORATED	Porch C	Tan		0	Negative
51	Porch Skirting	Wood	C	DETERIORATED	Porch C	Tan		0	Negative
52	Porch Column	Wood	C	DETERIORATED	Porch C	Tan		0	Negative
53	Porch Beam	Wood	C	DETERIORATED	Porch C	Tan		0	Negative
54	Porch Floor	Wood	C	DETERIORATED	Porch C	Brown		0	Negative
55	Railing	Wood	C	DETERIORATED	Porch C	Brown		0.1	Negative
56	Porch Ceiling	Wood	C	DETERIORATED	Porch C	Brown		0.1	Negative
57	Porch Ceiling	Wood	C	DETERIORATED	Porch C	Brown		0	Negative
58	Soffit	Wood	C	DETERIORATED	Porch C	Brown		0	Negative
59	Fascia	Wood	C	DETERIORATED	Porch C	Brown		0	Negative
60	Siding	Wood	D	DETERIORATED	Exterior House	Green		13.3	Positive
61	Foundation	Brick	D	DETERIORATED	Exterior House	Brown		0.3	Negative
62	Bsmt. Wn. Case	Wood	D	DETERIORATED	Exterior House	Brown		0	Negative
63	Win. Casing	Wood	D	DETERIORATED	Exterior House	Tan		5.7	Positive
64	Win. Sill-Stool	Wood	D	DETERIORATED	Exterior House	Tan		9.8	Positive
65	Corner Board	Wood	D	DETERIORATED	Exterior House	Tan		22.1	Positive
66	Win. Casing	Wood	D	DETERIORATED	Exterior House	Tan		24.4	Positive
67	Win. Sash	Wood	D	DETERIORATED	Exterior House	Tan		21.8	Positive
68	Soffit	Wood	A	DETERIORATED	Porch A	Tan		26	Positive
69	Fascia	Wood	A	DETERIORATED	Porch A	Tan		26.2	Positive
70	CALIBRATE					Green		1	Positive
71	CALIBRATE					Green		1	Positive
72	CALIBRATE					Green		1	Positive

VI License and Certification

Indiana State Department of Health
William C Center
 Lead Risk Assessor License # IND000368

Effective: 10/14/2009 Expiration: 10/14/2024
 Birth Date: 08/21/1984 Gender: M
 Height: 5' 7" Eye Color: Green
 Weight: 205 Hair Color: Brown

Indiana Department of Homeland Security
 302 W. Washington, E-241
 Indianapolis, IN 46204

Radioactive Material Facility Registration

Registration Number	Expiration Date	Registration Status
XN000605	11/20/2022	Active

Greentree Environmental Services, Inc.
 5287 Central Ave/ PO Box 2297
 Portage IN 46368

Stephen Cox
 Stephen Cox
 Executive Director
 Indiana Department of Homeland Security

Certificate of Training

Has completed the Heuresis Corp. training materials presented on the topic of Instrument Operator Training, Pb200i, with regards to the materials licensed by the Commonwealth of Massachusetts and the Nuclear Regulatory Commission.

HEURESIS CORPORATION

Instrument Operator Training
 Heuresis Corporation, Pb200i

I confirm that the above named individual has received the training listed on this certificate.

[Signature]
 Adam Robison
 Name October 22nd, 2018
 Title Date
 Sales and Product Specialist



I certify that I have received the stated training and understand the content presented. I understand that I can follow up this training with questions from Heuresis Corporation.

William Center October 22nd, 2018
 Name Date

CONGRATULATIONS

William Center

has successfully completed the U.S. Department of Housing and Urban Development, Office of Healthy Homes and Lead Hazard Control's

VISUAL ASSESSMENT COURSE
 pursuant to 24 Code of Federal Regulations Part 315

Zanetta G. Havelock
 Director, Program Management and Assurance Division
 Office of Healthy Homes and Lead Hazard Control

U.S. Department of Housing and Urban Development

VII Photograph Log



Side A



Side B



Side C



Side D



Address



Attic window and components A, Soffit, fascia, and upper trim (assumed positive)



Siding, soffit, fascia, and upper Trim A (assumed positive)



Siding A



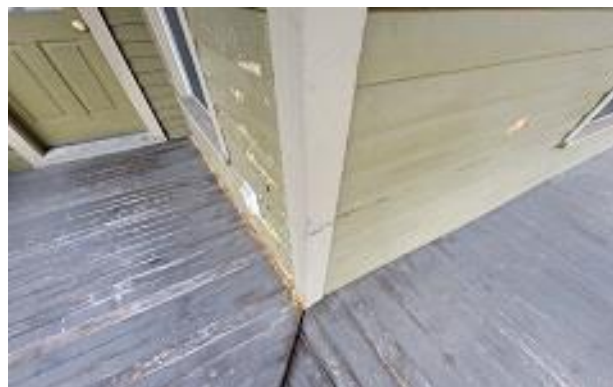
Door header trim A (a)



Door threshold A (a)



Door header trim A (b)



Corner boards ABCD



Window casing, sill, and siding ABCD



Attic window and casing, soffit, fascia, and upper trim B (assumed positive)



Window and casing B



Corner board C



Siding, window casing, and sill C



Door header trim C1



Door header trim C2



Door header trim C3



Attic window and casing, upper Trim, soffit, and fascia D (assumed positive)



Window and casing D



Porch A ceiling



Porch A support beam



Porch A upper trim, décor, and Siding (assumed positive)

VIII Glossary

The following terms and definitions are collected and presented utilizing information found in HUD's Lead Safe Housing Rule, 24 CFR 35, section 35.110.

Building Component: An architectural element of a dwelling unit or common area identified by type and location, such as a bedroom wall, an exterior window sill, a baseboard in a Bathroom, a kitchen floor, an interior window sill in a bathroom, a porch floor, stair treads in a common stairwell, or an exterior wall.

Certified: [An individual who is] licensed or certified to perform such activities as risk assessment, lead-based paint inspection, or abatement supervision, either by a State or Indian tribe with a lead-based paint certification program authorized by the EPA in accordance with 40 CFR part 745, subparts L or Q.

Clearance examination: An activity conducted following lead-based paint hazard reduction activities to determine that the hazard reduction activities are complete and that no soil-lead hazards or settled dust-lead hazards, as defined in this part, exist in the dwelling unit or worksite. The clearance process includes a visual assessment and collection and analysis of environmental samples.

Deteriorated paint: 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.

EPA: The United States Environmental Protection Agency.

Evaluation: A risk assessment, a lead hazard screen, a lead-based paint inspection, paint testing, or a combination of these to determine the presence of lead-based paint hazards or lead-based paint.

Hazard reduction: Measures designed to reduce or eliminate human exposure to lead-based paint hazards through methods including interim controls or abatement or a combination of the two.

HUD: The United States Department of Housing and Urban Development.

HUD-owned property: Residential property owned or managed by HUD, or for which HUD is a trustee or conservator.

Inspection: See *Lead-based paint inspection*.

Interim controls: A set of measures designed to reduce temporarily human exposure or likely exposure to lead-based paint hazards. Interim controls include, but are not limited to, repairs, painting, temporary containment, specialized cleaning, clearance, ongoing lead-based paint maintenance activities, and the establishment and operation of management and resident education programs.

Lead-based paint: Paint or other surface coatings that contain lead equal to or exceeding 1.0 milligram per square centimeter or 0.5 percent by weight or 5,000 parts per million (ppm) by weight.

Lead-based paint hazard: Any condition that causes exposure to lead from dust-lead hazards, soil-lead hazards, or lead-based paint that is deteriorated or present in chewable surfaces, friction surfaces, or impact surfaces, and that would result in adverse human health effects.

Lead-based paint inspection: A surface-by-surface investigation to determine the presence of lead-based paint and the provision of a report explaining the results of the investigation.

Occupant: A person who inhabits a dwelling unit.

Owner: A person, firm, corporation, nonprofit organization, partnership, government, guardian, conservator, receiver, trustee, executor, or other judicial officer, or other entity which, alone or with others, owns, holds, or controls the freehold or leasehold title or part of the title to property, with or without actually possessing it. The definition includes a vendee who possesses the title but does not include a mortgagee or an owner of a reversionary interest under a ground rent lease.

Paint stabilization: Repairing any physical defect in the substrate of a painted surface that is causing paint deterioration, removing loose paint and other material from the surface to be treated, and applying a new protective coating or paint.

Paint testing: The process of determining, by a certified lead-based paint inspector or risk assessor, the presence or the absence of lead-based paint on deteriorated paint surfaces or painted surfaces to be disturbed or replaced.

Painted surface to be disturbed: A paint surface that is to be scraped, sanded, cut, penetrated or otherwise affected by rehabilitation work in a manner that could potentially create a lead-based paint hazard by generating dust, fumes, or paint chips.

Residential property: A dwelling unit, common areas, building exterior surfaces, and any surrounding land, including outbuildings, fences and play equipment affixed to the land, belonging to an owner and available for use by residents, but not including land used for agricultural, commercial, industrial or other non-residential purposes, and not including paint on the pavement of parking lots, garages, or roadways.

Risk assessment: (1) An on-site investigation to determine the existence, nature, severity, and location of lead-based paint hazards; and (2) the provision of a report by the individual or firm conducting the risk assessment explaining the results of the investigation and options for reducing lead-based paint hazards.

Single-family property: A residential property containing one through four dwelling units.

Substrate: The material directly beneath the painted surface out of which the components are constructed, including wood, drywall, plaster, concrete, brick or metal.

Tenant: The individual named as the lessee in a lease, rental agreement or occupancy agreement for a dwelling unit.

Visual assessment: Looking for, as applicable: (1) deteriorated paint; (2) visible surface dust, debris and residue as part of a risk assessment or clearance examination; or (3) the completion or failure of a hazard reduction measure.

IX Performance Characteristic Sheet for XRF

Performance Characteristic Sheet

HEURESIS PCS December 2015

Performance Characteristic Sheet

EFFECTIVE DATE: December 1, 2015

MANUFACTURER AND MODEL:

Make: *Heuresis*
 Models: *Model Pb200i*
 Source: *⁵⁷Co, 5 mCi (nominal – new source)*

FIELD OPERATION GUIDANCE

OPERATING PARAMETERS:

Action Level mode

XRF CALIBRATION CHECK LIMITS:

0.8 to 1.2 mg/cm² (inclusive)

SUBSTRATE CORRECTION:

Not applicable

INCONCLUSIVE RANGE OR THRESHOLD:

ACTION LEVEL MODE READING DESCRIPTION	SUBSTRATE	THRESHOLD (mg/cm ²)
Results not corrected for substrate bias on any substrate	Brick	1.0
	Concrete	1.0
	Drywall	1.0
	Metal	1.0
	Plaster	1.0
	Wood	1.0

HEURESIS PCS December 2015

BACKGROUND INFORMATION

EVALUATION DATA SOURCE AND DATE:

This sheet is supplemental information to be used in conjunction with Chapter 7 of the HUD *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* ("HUD Guidelines"). Performance parameters shown on this sheet are calculated using test results on building components in the HUD archive. Testing was conducted on 146 test samples in November 2015, with two separate instruments running software version 2.1-2 in Action Level test mode. The actual source strength of each instrument on the day of testing was approximately 2.0 mCi; source ages were approximately one year.

OPERATING PARAMETERS

Performance parameters shown in this sheet are applicable only when properly operating the instrument using the manufacturer's instructions and procedures described in Chapter 7 of the HUD Guidelines.

XRF CALIBRATION CHECK:

The calibration of the XRF instrument should be checked using the paint film nearest 1.0 mg/cm² in the NIST Standard Reference Material (SRM) used (e.g., for NIST SRM 2579, use the 1.02 mg/cm² film).

If the average (rounded to 1 decimal place) of three readings is outside the acceptable calibration check range, follow the manufacturer's instructions to bring the instrument into control before XRF testing proceeds.

SUBSTRATE CORRECTION VALUE COMPUTATION:

Chapter 7 of the HUD Guidelines provides guidance on correcting XRF results for substrate bias. Supplemental guidance for using the paint film nearest 1.0 mg/cm² for substrate correction is provided:

XRF results are corrected for substrate bias by subtracting from each XRF result a correction value determined separately in each house for single-family housing or in each development for multifamily housing, for each substrate. The correction value is an average of XRF readings taken over the NIST SRM paint film nearest to 1.0 mg/cm² at test locations that have been scraped bare of their paint covering. Compute the correction values as follows:

Using the same XRF instrument, take three readings on a bare substrate area covered with the NIST SRM paint film nearest 1 mg/cm². Repeat this procedure by taking three more readings on a second bare substrate area of the same substrate covered with the NIST SRM.

Compute the correction value for each substrate type where XRF readings indicate substrate correction is needed by computing the average of all six readings as shown below.

For each substrate type (the 1.02 mg/cm² NIST SRM is shown in this example; use the actual lead loading of the NIST SRM used for substrate correction):

$$\text{Correction value} = (1\text{st} + 2\text{nd} + 3\text{rd} + 4\text{th} + 5\text{th} + 6\text{th Reading})/6 - 1.02 \text{ mg/cm}^2$$

Repeat this procedure for each substrate requiring substrate correction in the house or housing development.

EVALUATING THE QUALITY OF XRF TESTING:

Randomly select ten testing combinations for retesting from each house or from two randomly selected units in multifamily housing.

Conduct XRF re-testing at the ten testing combinations selected for retesting.

HEURESIS PCS December 2015

Determine if the XRF testing in the units or house passed or failed the test by applying the steps below.

Compute the Retest Tolerance Limit by the following steps:

Determine XRF results for the original and retest XRF readings. Do not correct the original or retest results for substrate bias. In single-family and multi-family housing, a result is defined as a single reading. Therefore, there will be ten original and ten retest XRF results for each house or for the two selected units.

Calculate the average of the original XRF result and the retest XRF result for each testing combination.

Square the average for each testing combination.

Add the ten squared averages together. Call this quantity C.

Multiply the number C by 0.0072. Call this quantity D.

Add the number 0.032 to D. Call this quantity E.

Take the square root of E. Call this quantity F.

Multiply F by 1.645. The result is the Retest Tolerance Limit.

Compute the average of all ten original XRF readings.

Compute the average of all ten re-test XRF readings.

Find the absolute difference of the two averages.

If the difference is less than the Retest Tolerance Limit, the inspection has passed the retest. If the difference of the overall averages equals or exceeds the Retest Tolerance Limit, this procedure should be repeated with ten new testing combinations. If the difference of the overall averages is equal to or greater than the Retest Tolerance Limit a second time, then the inspection should be considered deficient.

Use of this procedure is estimated to produce a spurious result approximately 1% of the time. That is, results of this procedure will call for further examination when no examination is warranted in approximately 1 out of 100 dwelling units tested.

TESTING TIMES:

In the Action Level paint test mode, the instrument takes the longest time to complete readings close to the Federal standard of 1.0 mg/cm². The table below shows the mean and standard deviation of actual reading times by reading level for paint samples during the November 2015 archive testing. The tested instruments reported readings to one decimal place. No significant differences in reading times by substrate were observed. These times apply only to instruments with the same source strength as those tested (2.0 mCi). Instruments with stronger sources will have shorter reading times and those with weaker sources, longer reading times, than those in the table.

Mean and Standard Deviation of Reading Times in Action Level Mode by Reading Level		
Reading (mg/cm²)	Mean Reading Time (seconds)	Standard Deviation (seconds)
< 0.7	3.48	0.47
0.7	7.29	1.92
0.8	13.95	1.78
0.9 – 1.2	15.25	0.66
1.3 – 1.4	6.08	2.50
≥ 1.5	3.32	0.05

HEURESIS PCS December 2015

CLASSIFICATION OF RESULTS:

XRF results are classified as **positive** if they are **greater than or equal** to the stated threshold for the instrument (1.0 mg/cm²), and *negative* if they are *less than* the threshold.

DOCUMENTATION:

A report titled *Methodology for XRF Performance Characteristic Sheets* (EPA 747-R-95-008) provides an explanation of the statistical methodology used to construct the data in the sheets, and provides empirical results from using the recommended inconclusive ranges or thresholds for specific XRF instruments. The report may be downloaded at <http://www2.epa.gov/lead/methodology-xrf-performance-characteristic-sheets-epa-747-r-95-008-september-1997>.

This XRF Performance Characteristic Sheet (PCS) was developed by QuanTech, Inc., under a contract with the XRF manufacturer.