



**LAW**

ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

**REPORT OF ENVIRONMENTAL SAMPLING  
AND OBSERVATIONS:  
BUILDING PACKAGE 110**

**HARPER'S FERRY NATIONAL HISTORIC PARK  
HARPER'S FERRY, WEST VIRGINIA**

**Submitted to:  
U.S. NATIONAL PARK SERVICE**

**Prepared for:  
HARPER'S FERRY NATIONAL HISTORIC PARK  
Harper's Ferry, West Virginia**

**Prepared by:  
LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.  
4465 Brookfield Corporate Drive  
Chantilly, VA 20151**

**LAW Project 20340-7-1428 Phase 03**

**February 4, 1997**



**LAW**

ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

February 4, 1997

Mr. Peter Dessauer, Architect  
Harper's Ferry National Historic Park  
P.O. Box 65  
Harper's Ferry, West Virginia 25425

Subject: **Report on Environmental Sampling and Observations  
Harper's Ferry National Historic Park  
Harper's Ferry, West Virginia  
Package 110 Buildings  
LAW Project 20340-7-1428 Phase 03**

Dear Mr. Dessauer:

Law-Engineering and Environmental Services, Inc. (LAW) is pleased to present this report of our Asbestos-Containing Materials (ACM) and Lead Based Paint (LBP) sampling along with the results of a visual Polychlorinated Biphenyl (PCB) survey at the subject site. Our services were performed in accordance with the scope of services described in our proposal PW6-13227, dated January 6, 1997. This work was performed in conjunction with the HAFE Park Flood/Storm Recovery Program. This report includes sections describing the following: project information, scope of services and credits, analytical results along with references to the method of analysis, recommendations, and qualifications. Drawings indicating sampling locations are attached in Appendix 1.

### **Project Information**

Buildings 8, 9, 10, 11, 11A, 12, and 12A are located in Lower Town, Harper's Ferry, West Virginia. These buildings are collectively referred to as the "Package 110 buildings". The buildings are of prominent red brick masonry, 18th century construction, and are located at the eastern end of Shenandoah Street. Each building's roof consists of a pitched roof system with slate shingles over roofing felts. The need for renovations to roof systems on the Package 110 buildings due to extreme weather in recent years required the collection of lead-based paint and asbestos samples in addition to a survey for PCB containing electrical devices to determine the presence or absence of hazardous materials in the buildings' roofs.

## Scope of Services and Credits

On Tuesday, January 21, 1997, LAW representatives Mr. Christopher Kase and Mr. Irvin Bridgewater arrived on-site to perform the above-mentioned sampling. Accompanied by HAFE Park Architect, Mr. Peter Dessauer, and a Park Service equipment operator, LAW collected twenty lead-based paint or bulk material samples and thirteen bulk asbestos samples. The collection of samples involved access to the roof systems by bucket truck with an extension arm and dry cutting or scraping of the material sampled.

In order to avoid unnecessary damage to painted surfaces, paint samples were collected from painted surfaces which were in poor condition. Therefore, samples of roofing component paint were easily extracted by hand and knife tip. Eighteen paint samples and two bulk material samples were collected from the roofs of the buildings. The samples were analyzed by an Environmental Lead Laboratory Accreditation Program (ELLAP) certified laboratory in general accordance with modified EPA Method 846-3050 with subsequent analysis by Flame Atomic Absorption Spectroscopy (FLAA) or Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP-AES).

LAW collected thirteen material samples from the roofing systems of the buildings for analysis of asbestos content. These included samples of roofing felt, roofing mastic/sealer, glazing compound, and brick mortar. Bulk samples were analyzed at LAW's National Voluntary Laboratory Accreditation Program (NVLAP) accredited asbestos laboratory in Chantilly, Virginia using Polarized Light Microscopy (PLM) with dispersion staining, following the Environmental Protection Agency's (EPA's) "*Method for the Determination of Asbestos in Bulk Building Materials, EPA-600/R-93/116, July 1993*".

LAW performed a visual PCB survey during a subsequent visit to the park, January 28, 1997. This survey involved locating and noting the PCB status of fluid-containing electrical devices associated with the buildings' roofs.

## Results

The following sections present the results of LAW's on-site LBP and ACM sampling, along with the results of our observations during the visual PCB survey.

### Lead Based Paint (LBP) Sampling

The analytical results of the LBP sampling are presented in the following table. The sample locations are presented on the drawings in Appendix 1, and the laboratory analytical results are presented in Appendix 2.

**Table 1 - Lead Based Paint Analytical Results**

| Sample ID | Location                                    | Concentration (% by weight) |
|-----------|---------------------------------------------|-----------------------------|
| P8-01     | Bldg. 8, North East Corner, End Trim, Cream | 0.62 *                      |
| P9-01     | Bldg. 9, South Corner, Snow Board, Cream    | 0.04                        |
| P9-02     | Bldg. 9, South Side, Dormer Sill, Cream     | 0.01                        |
| P9-03     | Bldg. 9, South Side, Dormer Casing, Cream   | 0.004                       |
| P10-01    | Bldg.10, South Side, Gable End, Cream       | 0.007                       |
| P10-02    | Bldg.10, South Side, Dormer Style, Cream    | 0.01                        |
| P10-03    | Bldg.10, South Side, Dormer Rail, Cream     | 0.01                        |
| P10-04    | Bldg.10, South Side, Dormer Sill, Cream     | 0.02                        |
| P11-01    | Bldg.11, South Side, Dormer Casing, Cream   | 1.23 *                      |
| P11-02    | Bldg.11, South Side, Dormer Casing, Cream   | 3.96 *                      |
| P12-01    | Bldg.12, South Side, Gutter , Black         | 0.06                        |
| P12-02    | Bldg.12, South Side, Snow Board, Cream      | 3.62 *                      |
| P12-03    | Bldg.12, South Side, Dormer Casing, Cream   | 2.96 *                      |
| P12-04    | Bldg.12, South Side, Dormer Casing, Cream   | 2.07 *                      |
| P12A-01   | Bldg.12A, West Side, Snow Board, Cream      | 0.01                        |
| P12A-02   | Bldg.12A, West Side, Gable, Cream           | 0.06                        |
| P11A-01   | Bldg.11A, West Side, Fascia Board, Cream    | 1.78 *                      |
| P11A-02   | Bldg.11A, West Side, South Rake, Cream      | 3.38 *                      |

\* - lead-based paint

In addition to the paint samples, two rain gutter solder samples were collected. One sample was collected from the south side of Building 9 (P9-04) and the other from the south side of Building 11 (P11-03). Older rain gutter soldering has been known to contain high concentrations of lead. Samples P9-04 and P11-03 contained 23.5 and 20.6 percent lead by weight, respectively.

Paint is considered lead based, as defined in the Lead-Based Paint Poisoning Prevention Act (LBPPPA), if the lead concentration in the paint is equal to or greater than 0.5 percent by weight. Paint collected from Buildings 8, 11, 11A, and 12 showed levels of lead well above this threshold level. Painted surfaces on these buildings with similar color should be considered as containing lead-based paint. It should be noted that although paint may contain lead concentrations of less than 0.5 percent by weight, a health hazard may still exist depending on the condition of the paint and the method of removal used during renovation activities.

Additionally, the rain water down-spouting solder on the buildings should be considered as containing lead and subject to the same precautions as paint determined to be lead-based. Rain water down-spouting which contains high levels of lead in its soldering has the potential to spread lead contamination through leaching of lead into the rain water and thus transferring lead contamination to the run-off site at the end of the spouting.

#### Asbestos Sampling

The analytical results are presented in the following table. The sampling locations are indicated on the drawing in Appendix 1, and the laboratory analytical results are presented in Appendix 3.

**Table 2 - Asbestos-Containing Material Analytical Results**

| Sample ID | Location                                          | <sup>1</sup> Sample Type | ACM? Y/N | If ACM, %, <sup>2</sup> ID |
|-----------|---------------------------------------------------|--------------------------|----------|----------------------------|
| A8-01     | Bldg.8, Northeast corner, roof felt               | F                        | N        | n/a                        |
| A8-02     | Bldg.8, Northeast corner, roof mastic around nail | M                        | Y        | 15, Chrys.                 |
| A8-03     | Bldg.8, East side, mortar around chimney brick    | R                        | N        | n/a                        |
| A9-01     | Bldg.9, East side, mortar around chimney brick    | R                        | N        | n/a                        |
| A9-02     | Bldg.9, East side, roof felt                      | F                        | N        | n/a                        |
| A9-03     | Bldg.9, East side, roof mastic at metal flashing  | M                        | Y        | 15, Chrys.                 |
| A9-04     | Bldg.9, South side, roof felt (left dormer)       | F                        | N        | n/a                        |
| A9-05     | Bldg.9, South side, roof mastic around nail hole  | M                        | Y        | 15, Chrys.                 |
| A10-01    | Bldg.10, South side, caulking (dormer window)     | G                        | N        | n/a                        |
| A11-01    | Bldg.11, South side, roof felt                    | F                        | N        | n/a                        |
| A12-01    | Bldg.12, South side, roof mastic (top of dormer)  | M                        | Y        | 15, Chrys.                 |
| A11A-01   | Bldg.11A, West side, roof mastic around nail      | M                        | Y        | 15, Chrys.                 |
| A11A-02   | Bldg.11A, West side, roof felt                    | F                        | N        | n/a                        |

<sup>1</sup>Sample Type: F = Felt, M = Mastic, R = Mortar, G = Glazing/Caulking

<sup>2</sup>Identification of Asbestos Type: Chrys. = chrysotile asbestos.

<sup>3</sup>n/a = percentage and identification not applicable on negative samples.

A material is considered asbestos-containing if it contains within its binding matrix greater than 1.0 percent asbestos as determined through visual estimation. All five mastic samples taken from the buildings had asbestos concentrations in excess of the threshold level which makes them asbestos-containing materials. However, OSHA (29 CFR 1910.1101) considers these "incidental roofing materials". This allows for the use of manual removal methods as long as the asbestos-containing materials remain intact. The roof felts and mortar samples tested negative for the presence of asbestos.

#### Visual PCB Survey

Following the conversation between LAW and HAFE Park architect Mr. Peter Dessauer of January 28, 1997, it was determined that lighting fixtures located in the upper floors of the buildings would not be affected by roof renovation activities. LAW performed a walk-through

inspection of the interior and exterior of the Package 110 buildings to locate any other fluid-containing electrical devices which would be of concern during roof renovation activities. Examples of these devices include transformers, capacitor banks, and switching devices. None were found.

### **Recommendations**

Paint sampling performed by LAW shows that there are painted surfaces on Package 110 buildings 8, 11, 11A, and 12 which are considered to be lead-based. Additionally, rain water down-spouting solder samples were identified as having high levels of lead. All rain water down-spouting solder should be considered as containing high levels of lead. Special considerations are needed for renovations involving the building components tested as positive for lead.

Any renovations that will disturb lead-based paint must be conducted in accordance with EPA, OSHA, and local regulations by a licensed and qualified lead abatement contractor. Protection of lead abatement workers during this type of work requires compliance with OSHA regulations as found in the Code of Federal Regulations, 29 CFR 1910.1025 and 29 CFR 1926.62. Disposal of construction waste should be performed in strict accordance with the EPA mandates as found in Title IV of the Toxic Substances Control Act (TSCA), section 402(a) (1).

When considering abatement of LBP, the least expensive and easiest method would be replacement of roof components painted with LBP. Components identified as having LBP which are in good condition should be considered for abatement. While the paint does not present an immediate health hazard, it is likely that weathering due to environmental stresses common to the region would adversely affect the condition of painted surfaces. Renovation activities involving sanding, cutting, grinding, or abrading of the components identified as having LBP should be avoided.

Asbestos-containing materials were identified in the roofing systems of the Package 110 buildings. These are limited to the mastics around nail heads and flashing. These mastics are non-friable and are considered by OSHA to be "incidental building materials". Removal of these materials should be performed by appropriately trained personnel and in accordance with the Code of Federal Regulations, 29 CFR 1926.1101. Renovation activities that may pulverize these mastics should be

avoided, such as sanding, cutting, grinding, or abrading. Any mastic encountered during renovation activities associated with Package 110 buildings should be presumed to be asbestos-containing.

### Qualifications

LAW has endeavored to observe the existing conditions at the Package 110 buildings using generally accepted procedures. Our findings are based upon our observations at the site and analysis of the samples collected at the time of this survey. Additional asbestos-containing materials and lead-based paints may exist in other portions of the site roofs, but were not tested due to their inaccessibility. We performed no demolition to gain access to suspect material. Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

### Closing

LAW appreciates the opportunity to continue to provide consulting services to the National Park Service on this important project. If you have any questions following your review of this report, please do not hesitate to contact us at (703) 968-4700.

Sincerely,

LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

  
Christopher Kase  
Project Scientist

BY   
WITH PERMISSION

  
Irvin L. Bridgewater III  
Project Manager

  
William Kilpatrick, Ph.D., P.E.  
Principal

CK/ILB/WK:ck/ech  
BY   
WITH PERMISSION

Appendices: Appendix 1 - Drawing of LBP and ACM Sampling Locations  
Appendix 2 - LBP Laboratory Analytical Results  
Appendix 3 - ACM Laboratory Analytical Results

Attachments: Copy of report text on 3½ inch diskette.

**APPENDIX 1**

**LBP AND ACM SAMPLING LOCATIONS ON  
BUILDING PACKAGE 110  
ROOF SYSTEMS**

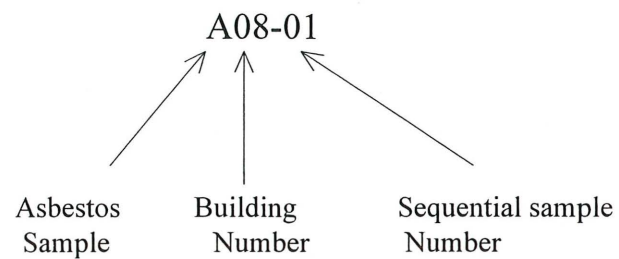
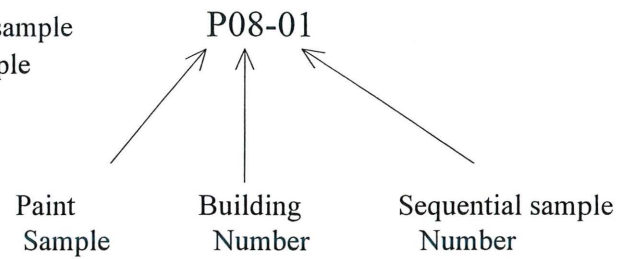
## APPENDIX 1 LEGEND

### LBP AND ACM SAMPLING LOCATIONS ON DRAWINGS SUPPLIED BY THE NATIONAL PARK SERVICE

\*Sample ID prefix:

A = Asbestos sample

P = Paint sample



Legend:

A8-03

AB-01

P8-01

2

PIIA-01

A11A-02

A9-D3

A9-D1

A4-02

-01-

5

7

94-03

Q1-02



U

Blue (11A)

ALLA-01

211A-02

BLDG (12A)

212A-01

A-02

A19-01

210

212-03

2-02.

D11-02

ALL - C

⑤

P11-01

110-03

1

111

३



11

1

**APPENDIX 2**

**LEAD BASED PAINT  
LABORATORY ANALYTICAL RESULTS  
PACKAGE 110 BUILDINGS**

## AMERICAN MEDICAL LABORATORIES, INC.

P.O. Box 10841 &amp; 14225 Newbrook Drive, Chantilly, Virginia 22021-0841

Telephone: (703) 802-6900

Age and sex dependent reference ranges are printed when available  
if age and sex are designated. Otherwise, adult values are given.

## INDUSTRIAL HYGIENE DEPARTMENT

PAGE 1

D

RECEIVED : 01/22/97 17227 LAW ENGINEERING  
RELEASED : 02/03/97 ATTN: DENNIS ETEL  
REPORTED : 02/03/97 4465 BROOKFIELD CORPORATE DR.  
WORK ORDER: 132474 CHANTILLY, VA  
201511652

PROJECT NAME/JOB ID: 20340-7-1428-110  
: C. KASE

AML NUMBER-----VALUE-----UNITS-----

8582744 P8-01 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT, CREAM, NE CORNER, BLDG 8 END TRIM  
Concentration: 0.624 % Lead  
Analyst: Don Johnsey

8582745 P9-01 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT, CREAM, S CORNER, BLDG 9 SNOW BOARD  
Concentration: 0.037 % Lead  
Analyst: Don Johnsey

8582746 P9-02 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT, CREAM, S SIDE, BLDG 9 L.DORMER SILL  
Concentration: 0.012 % Lead  
Analyst: Don Johnsey

8582747 P9-03 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT, CREAM, S SIDE, BLDG 9 L.DORMER CASING  
Concentration: 0.0036 % Lead  
Analyst: Don Johnsey

REPORT CONTINUED ON NEXT PAGE...



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AML NUMBER-----VALUE-----UNITS-----

8582748 P9-04 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
BULK WELDING BLACK, BUILDING 9, GUTTER SOLDER  
Concentration: 23.5 % Lead  
Analyst: Don Johnsey

8582749 P10-01 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM, BUILDING 10, GABLE END  
Concentration: 0.0071 % Lead  
Analyst: Don Johnsey

8582750 P10-02 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM, BUILDING 10, R. DORMER STYLE  
Concentration: 0.010 % Lead  
Analyst: Don Johnsey

8582751 P10-03 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM, BUILDING 10, L. DORMER RAIL  
Concentration: 0.0095 % Lead  
Analyst: Don Johnsey

8582752 P10-04 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM, BUILDING 10, L. DORMER SILL  
Concentration: 0.0201 % Lead  
Analyst: Don Johnsey

REPORT CONTINUED ON NEXT PAGE...

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PAGE 3

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AML NUMBER-----VALUE-----UNITS-----

8582753 P11-01 Bulk

3330 LEAD IN PAINT

Site/Location:

PAINT CREAM, BUILDING 11, R. DORMER CASING

Concentration: 1.23 % Lead

Analyst: Don Johnsey

## NOTATIONS

Analysis for lead in paint is performed via modified  
EPA 846-3050 with subsequent analysis by flame atomic  
absorption spectroscopy (FLAA) or Inductively Coupled  
Plasma (ICP).

As per "Lead-Based Paint; Interim Guidelines for Hazard  
Identification and Abatement in Public and Indian  
Housing; September, 1990, regulatory guidelines  
are 0.5% lead by weight or 1 mg/cm<sup>2</sup> lead content by  
area.

Excess backing material such as wallboard or wood  
submitted as sample may cause a result to appear  
lower than is actually correct for results reported in  
weight percent.

\*\*\* REASON FOR CORRECTION \*\*\*

Site/Location corrected

\*\*\* CORRECTED REPORT \*\*\*

BRYAN MASON

DIRECTOR, IND. HYGIENE

FOR INDUSTRIAL HYGIENE RELATED QUESTIONS,  
INCLUDING REQUESTS FOR SUPPLIES, CALL

1-800-348-1590

[P 24214]-[S 428]

Ira D. Godwin, M.D.  
Director of Laboratories

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WORK ORDER: 132475 CHANTILLY, VA  
201511652

PROJECT NAME/JOB ID: 20340-7-1428/110

: C. KASE

AML NUMBER-----VALUE-----UNITS-----

8582754 P11-02 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM S. SIDE BLDG. #11 L. DORMER CASING  
Concentration: 3.96 % Lead  
Analyst: Don Johnsey

8582755 P11-03 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
BULK WELD. BLACK, BUILDING 11, GUTTER SOLDER D  
Concentration: 20.6 % Lead  
Analyst: Don Johnsey

8582756 P12-01 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT BLACK, BUILDING 12, GUTTER  
Concentration: 0.0588 % Lead  
Analyst: Don Johnsey

8582757 P12-02 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM, BUILDING 12, SNOW BOARD  
Concentration: 3.62 % Lead  
Analyst: Don Johnsey

REPORT CONTINUED ON NEXT PAGE...

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## INDUSTRIAL HYGIENE DEPARTMENT

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AML NUMBER-----VALUE-----UNITS-----

8582758 P12-03 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM, BUILDING 12, R. DORMER CASING  
Concentration: 2.96 % Lead  
Analyst: Don Johnsey

8582759 P12-04 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM, BUILDING 12, L. DORMER CASING  
Concentration: 2.07 % Lead  
Analyst: Don Johnsey

8582760 P12A-01 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM WEST, BUILDING 12A, SNOW BOARD  
Concentration: 0.0098 % Lead  
Analyst: Don Johnsey

8582761 P12A-02 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM WEST, BUILDING 12A, GABLE  
Concentration: 0.0598 % Lead  
Analyst: Don Johnsey

8582762 P11A-01 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM WEST, BUILDING 11A, FACIA BOARD  
Concentration: 1.78 % Lead  
Analyst: Don Johnsey

REPORT CONTINUED ON NEXT PAGE...

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## INDUSTRIAL HYGIENE DEPARTMENT

PAGE 3

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AML NUMBER-----VALUE-----UNITS-----

8582763 P11A-02 Bulk  
3330 LEAD IN PAINT  
Site/Location:  
PAINT CREAM WEST, BUILDING 11A, S. RAKE  
Concentration: 3.38 % Lead  
Analyst: Don Johnsey

## NOTATIONS

Analysis for lead in paint is performed via modified  
EPA 846-3050 with subsequent analysis by flame atomic  
absorption spectroscopy (FLAA) or Inductively Coupled  
Plasma (ICP).

As per "Lead-Based Paint; Interim Guidelines for Hazard  
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Excess backing material such as wallboard or wood  
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Site/Location corrected

## \*\*\* CORRECTED REPORT \*\*\*

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INCLUDING REQUESTS FOR SUPPLIES, CALL  
1-800-348-1590

[P 24214]-[S 429]

Ira D. Godwin, M.D.  
Director of Laboratories

**APPENDIX 3**

**ASBESTOS-CONTAINING MATERIAL  
LABORATORY ANALYTICAL RESULTS  
PACKAGE 110 BUILDINGS**

| TABLE 1<br>ASBESTOS BULK SAMPLE ANALYSIS<br>FOR<br>HAFE PARK STORM/FLOOD RECOVERY PROGRAM                                                                                                                                                                                                                                                                                            |                         |                                               |                                        |                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------|----------------------------------------|-------------------------|
| LAW PROJECT: 20340-7-1428                                                                                                                                                                                                                                                                                                                                                            |                         | CLIENT: HARPER'S FERRY NATIONAL HISTORIC PARK |                                        |                         |
| PHASE: 3                                                                                                                                                                                                                                                                                                                                                                             |                         | DATE SAMPLED: 1/21/97                         |                                        |                         |
| TASK: -----                                                                                                                                                                                                                                                                                                                                                                          |                         | INSPECTOR: I. BRIDGEWATER/C. KASE             |                                        |                         |
| FIELD<br>SAMPLE<br>NUMBER                                                                                                                                                                                                                                                                                                                                                            | LAB<br>SAMPLE<br>NUMBER | SAMPLE TYPE/COLOR                             | LOCATION                               | RESULTS OF PLM ANALYSIS |
| A8 - 01                                                                                                                                                                                                                                                                                                                                                                              | WA 28398                | ROOF FELT                                     | PACKAGE 110, NORTHEAST CORNER BLDG. #8 | NONE DETECTED           |
| * A8 - 02                                                                                                                                                                                                                                                                                                                                                                            | WA 28399                | ROOF MASTIC AROUND NAIL HEAD                  | PACKAGE 110, NORTHEAST CORNER BLDG. #8 | 15% CHRYSOTILE          |
| A8 - 03                                                                                                                                                                                                                                                                                                                                                                              | WA 28400                | MORTAR                                        | PACKAGE 110, EAST SIDE BLDG. #8        | NONE DETECTED           |
| A9 - 01                                                                                                                                                                                                                                                                                                                                                                              | WA 28401                | MORTAR                                        | PACKAGE 110, EAST SIDE BLDG. #9        | NONE DETECTED           |
| A9 - 02                                                                                                                                                                                                                                                                                                                                                                              | WA 28402                | ROOF FELT                                     | PACKAGE 110, EAST SIDE BLDG. #9        | NONE DETECTED           |
| * A9 - 03                                                                                                                                                                                                                                                                                                                                                                            | WA 28403                | ROOF MASTIC AT CHIMNEY METAL FLASHING         | PACKAGE 110, EAST SIDE BLDG. #9        | 15% CHRYSOTILE          |
| A9 - 04                                                                                                                                                                                                                                                                                                                                                                              | WA 28404                | ROOF FELT L. DORMER                           | PACKAGE 110, SOUTH SIDE BLDG. #9       | NONE DETECTED           |
| * A9 - 05                                                                                                                                                                                                                                                                                                                                                                            | WA 28405                | ROOF MASTIC AROUND NAIL HOLE                  | PACKAGE 110, SOUTH SIDE BLDG. #9       | 15% CHRYSOTILE          |
| A10 - 01                                                                                                                                                                                                                                                                                                                                                                             | WA 28406                | CAULKING R. DORMER                            | PACKAGE 110, SOUTH SIDE BLDG. #10      | NONE DETECTED           |
| A11 - 01                                                                                                                                                                                                                                                                                                                                                                             | WA 28407                | ROOF FELT                                     | PACKAGE 110, SOUTH SIDE BLDG. #11      | NONE DETECTED           |
| * A12 - 01                                                                                                                                                                                                                                                                                                                                                                           | WA 28408                | ROOF MASTIC, TOP OF R. DORMER                 | PACKAGE 110, SOUTH SIDE BLDG. #12      | 15% CHRYSOTILE          |
| * A11A - 01                                                                                                                                                                                                                                                                                                                                                                          | WA 28409                | ROOF MASTIC, AROUND HAIL HEAD                 | PACKAGE 110, WEST SIDE BLDG. #11A      | 15% CHRYSOTILE          |
| A11A - 02                                                                                                                                                                                                                                                                                                                                                                            | WA 28410                | ROOF FELT                                     | PACKAGE 110, WEST SIDE BLDG. #11A      | NONE DETECTED           |
| -----                                                                                                                                                                                                                                                                                                                                                                                | -----                   | -----                                         | -----                                  | -----                   |
| -----                                                                                                                                                                                                                                                                                                                                                                                | -----                   | -----                                         | -----                                  | -----                   |
| * Materials containing asbestiform minerals. The percent of various material components was estimated viaually by the microscopist during the analysis. Polarized Light Microscopy (PLM) coupled with dispersion staining was the method of identification used.                                                                                                                     |                         |                                               |                                        |                         |
| Floor tile and other resinously bound materials, when analyzed by the EPA method, may yield false negative results because of limitations in separating closely bound fibers and in detecting fibers of small length and diameter. When a definitive result is required, LAW recommends utilizing alternative methods of identification, including Transmission Electron Microscopy. |                         |                                               |                                        |                         |
| The results of these analyses should not be used as a scope of work for abatement without consulting LAW.<br>The results may be subject to Quality Control (QC) analysis. Should the QC result in a change to these results, a separate report will issued reflecting the changes.                                                                                                   |                         |                                               |                                        |                         |
| VA. LAB LICENSE #: 3333000Q10. NVLAP #: 101847                                                                                                                                                                                                                                                                                                                                       |                         |                                               |                                        |                         |



**LAW**

ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

June 25, 1996

Mr. Peter Dessauer  
National Park Service  
Harpers Ferry National Historic Park  
P.O. Box 65  
Harpers Ferry, West Virginia 25425

Subject:       **Report of Asbestos-Containing Material and  
Lead-Based Paint Sampling Survey  
Marmion Row Buildings  
Harpers Ferry National Historic Park  
LAW Project 20340-6-1111**

Dear Mr. Dessauer:

Law Engineering and Environmental Services, Inc. (LAW) has completed the survey for asbestos-containing materials and lead-based paint at the referenced site. Our survey included: visual observation, material sampling, and laboratory analysis of exterior building materials suspected of containing asbestos and lead-based paint. These services were authorized by the National Park Service acceptance of LAW's proposal PW5-12248, dated December 15, 1995, and authorized by you on February 5, 1996. Due to the recent flood damage at the park, you requested that we delay our survey until notified by your office to proceed. On May 22, 1996, your contacted our office and asked that we proceed with the survey. The survey was performed on June 7, 1996, by Mr. Irvin Bridgewater of LAW's Chantilly, Virginia office.

This report summarizes the findings of our survey and includes project information, survey procedures, and results. We have attached Appendices A, B, and C, identifying materials analyzed for asbestos (Appendix A), materials analyzed for lead (Appendix B), and providing an annotated drawing identifying locations where samples were taken (Appendix C).

### **Survey Results and Recommendations**

The following information presents the results of our survey, analytical results, and sample locations.

CC: CAMPBELL SURENSEN FOX WILHOE EBERSOLE

CC: STEVENS, HAMMERS,  
VITTEA, HICUS, McGRATH.

WOBLE BOLTON KING

SHACHEL STARNES

TELEPHONE CONVERSATION RECORD

MIHAUK BOYD

703-968-4723.

CONVERSATION WITH: MR. IRV BRIDGWATER - LAW ENGINEERING

DATE: WEDNESDAY JUNE 12, 1996. TIME: 10:45AM. CHANTILLY, VIRGINIA.

SUBJECT: HAZARDOUS WASTE INSPECTION - MARMLON ROW ROOFS.

HAFE PARK - BLDGS. 1A 1B 1C 1D - FRIDAY, JUNE 7, 1996.

PRIOR TO THE FORMAL REPORT ABOUT THE FIELD SAMPLES TAKEN AT THE MARMLON ROW ROOFS ON JUNE 7TH, IRV BRIDGWATER TELEPHONED TO INFORM ME ABOUT THE LABORATORY EXAMINATION RESULTS.

NOTES

① LAB RESULTS OF ROOF SAMPLES TAKEN 06/07/96:

| <u>MATERIAL</u> | <u>NO. SAMPLES</u> | <u>RESULTS:</u>                               |
|-----------------|--------------------|-----------------------------------------------|
| CEMENT SHINGLES | 4                  | NEGATIVE (NO ASBESTOS)                        |
| ROOF MASTIC     | 4                  | POSITIVE! - ACM -                             |
| ROOF FELT       | 3                  | NEGATIVE (NO ASBESTOS)                        |
| CHIMNEY STUCCO  | 2                  | NEGATIVE (NO ASBESTOS)                        |
| PAINT           | 14                 | 10 ARE Pb POSITIVE.<br>.5% Pb LEAD BY WEIGHT. |

② CONCLUSIONS FROM LABORATORY RESULTS:

- ALL PAINT SHOULD BE CONSIDERED LEAD PAINT LAYERS. A LOT OF LEAD PAINT.
- SHINGLES, FELT AND STUCCO BROKEN BITS DO NOT CONTAIN HAZARDOUS WASTE.
- ROOF MASTIC, IN VERY SMALL AMOUNTS; CONTAINS ASBESTOS.

③ EXISTING ROOF CONDITIONS: IRV BRIDGWATER OBSERVED:

- 10%-15% SHINGLES ARE BROKEN, CRACKED, OR LOOSE.
- 50% OF THE FERROUS FASTENERS FOR SHINGLES ARE RUSTED, SOME TO THE POINT OF FAILURE, MISSING NAIL HEADS.
- EXISTING PAINT ON ALL WOODWORK OF ROOFS AND BUILDING EXTERIOR IS FAILING 50% TOTAL AREA IS BLISTERING AND PEELING. PROBABLY TEAR 10% PAINT OFF WITH FINGERS.

ACTION

④ CONCLUSIONS: ROOF AND PAINT REPLACEMENT - AS HAS BEEN HAFE CYCICAL MAINTENANCE REQUEST FOR THE LAST 5 YEARS.

- WINTER 1996 STORMS AND BLIZZARDS MADE EXISTING CONDITIONS WORSE.
- THIS PROJECT OF REPLACEMENT IS NOW MORE IMPERATIVE THAN WHEN LAST DISCUSSED WITH FY'96 BUDGET (NON EXISTANT) IN AUGUST/SEPT. 1995.
- COSTS WILL BE: CLASS "C" @ \$200,000.00 / CLASS "B" @ 126,000 BY HAFE ARCHITECT AND TOM McGRATH. PROBABLY NOW @ \$200,000.00.
- HOW MUCH OF THE BUILDING PAINT NEEDS LEAD ABATEMENT REMOVAL BEFORE REPAINT?

\*

Bruce F. Dissalun 06/13/96.

### Asbestos-Containing Materials

Thirteen samples of suspect materials were collected and delivered to the laboratory for analysis. The samples were analyzed using Polarized Light Microscopy (PLM) coupled with Dispersion Staining as outlined in the Environmental Protection Agency's (EPA) "Method for the Determination of Asbestos in Bulk Building Materials" (EPA-600/R-93/116, July 1993). The EPA defines asbestos-containing material as material that contains at least one percent asbestos by weight.

Materials sampled included roofing felts, roofing mastic, cement shingles, and chimney stucco and mortar. Of the materials sampled, only the roofing mastic was identified as containing asbestos.

If this roofing mastic will not be disturbed in your renovations, no action is needed. However, if you anticipate that the roofing mastic will be disturbed, it must be removed according to EPA, OSHA, and all other applicable guidelines by a licensed asbestos contractor.

A complete list describing materials sampled, with their corresponding locations and results of laboratory analysis, is presented in Appendix A. Sample locations are delineated on the drawing in Appendix C.

### Lead-Based Paint

Fourteen paint samples were collected and delivered to the laboratory for analysis. The samples were analyzed using modified EPA Method 846-3050 with subsequent analysis by Flame Atomic Absorption Spectroscopy (FLAA) or Inductively Coupled Plasma (ICP).

Suspect paint samples were collected from gables, fascia boards, dormers, windows, door casings and gutters. The Lead Based Paint Poisoning Prevention Act (LBPPPA) defines lead-based paint as paint containing greater than or equal to 0.5 percent lead by weight. Of the fourteen samples collected, ten samples collected from the facias, door casings, dormers, windows, and gutters were identified as containing lead-based paint.

Any renovations that will disturb lead-based paint must be conducting in accordance with EPA, OSHA, and local regulations by an experienced and licensed lead abatement contractor.

A complete list describing paints sampled, their corresponding locations, and results of laboratory analysis is presented in Appendix B. Sample locations are delineated on the drawing in Appendix C.

Note of Interest:

During our survey, it was observed that the nail heads at the apron course of shingles in front of the dormer window sills were missing. The nail shanks were still present but evidenced corrosion. It was visually estimated that virtually all of these nail heads are no longer in place.

**Summary**

LAW has endeavored to observe the existing conditions at the site using generally accepted procedures. Our findings are based upon our observations at the facility and analysis of the samples collected at the time of this survey. Additional asbestos-containing materials and lead-based paints may exist in other portions of the facility, due to their inaccessibility or due to an undetected change in a material. We performed no demolition to gain access to suspect material. Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

We appreciate the opportunity to serve as your consultant on this project. If you have any questions concerning this report, please do not hesitate to contact us.

Sincerely,

LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.

*Irvin L. Bridgewater* by DOE  
Irvin L. Bridgewater, III with permission  
Project Manager

*William Kilpatrick* by alm  
William Kilpatrick, Ph.D., P.E. with permission  
Principal

Appendices: Appendix A - Asbestos Bulk Sample Analysis  
Appendix B - Lead-Based Paint Sample Analysis  
Appendix C - Annotated Drawing Showing Sample Locations

ILB/WK:ilb/alm

## **APPENDIX A**

### **ASBESTOS BULK SAMPLE ANALYSIS**

**TABLE 1**  
**ASBESTOS BULK SAMPLE ANALYSIS**  
**FOR**  
**MARMION ROW BUILDINGS**

LAW PROJECT NUMBER: 20340-6-1111

| FIELD SAMPLE NUMBER | LAB SAMPLE NUMBER | SAMPLE TYPE/COLOR    | LOCATION                    | RESULTS OF PLM ANALYSIS                         |
|---------------------|-------------------|----------------------|-----------------------------|-------------------------------------------------|
| MRA - 01            | WA 26573          | ROOF FELT            | HARPER HOUSE BY SOUTH GABLE | NONE DETECTED                                   |
| MRA - 02            | WA 26574          | CEMENT SHINGLE       | HARPER HOUSE BY SOUTH GABLE | NONE DETECTED                                   |
| MRA - 03            | WA 26575          | CHIMNEY STUCCO       | HARPER HOUSE W CHIMNEY      | NONE DETECTED                                   |
| MRA - 04*           | WA 26576          | NAIL HOLE MASTIC     | HARPER HOUSE W DORMER       | 20% CHRYSOTILE                                  |
| MRA - 05            | WA 26577          | LOOSE MORTAR SAMPLE  | HARPER HOUSE W SIDE         | NONE DETECTED                                   |
| MRA - 06            | WA 26578          | ROOF FELT            | WAGER HOUSE W SIDE          | NONE DETECTED                                   |
| MRA - 07            | WA 26579          | CEMENT SHINGLE       | WAGER HOUSE W SIDE          | NONE DETECTED                                   |
| MRA - 08*           | WA 26580          | ROOF MASTIC          | WAGER HOUSE W SIDE          | 10% CHRYSOTILE                                  |
| MRA - 09            | WA 26581          | CEMENT SHINGLE       | TENANT HOUSE 1C W DORMER    | NONE DETECTED                                   |
| MRA - 10*           | WA 26582          | ROOF MASTIC          | TENANT HOUSE 1C W SIDE      | 20% CHRYSOTILE                                  |
| MRA - 11*           | WA 26583          | ROOF FELT AND MASTIC | TENANT HOUSE 1C W SIDE      | NONE DETECTED IN FELT, 15% CHRYSOTILE IN MASTIC |
| MRA - 12            | WA 26584          | ROOF SHINGLE         | TENANT HOUSE 1D W SIDE      | NONE DETECTED                                   |
| MRA - 13*           | WA 26585          | ROOF MASTIC          | TENANT HOUSE 1D W SIDE      | 10% CHRYSOTILE                                  |
| -----               | -----             | -----                | -----                       | -----                                           |
| -----               | -----             | -----                | -----                       | -----                                           |

\* Materials containing asbestiform minerals -- The percent of various material components was estimated visually by the microscopist during the analysis. Polarized Light Microscopy (PLM) coupled with dispersion staining was the method of identification used.

Floor tile and other resinously bound materials, when analyzed by the EPA method, may yield false negative results because of limitations in separating closely bound fibers and in detecting fibers of small length and diameter. When a definitive result is required, LAW recommends utilizing alternative methods of identification, including Transmission Electron Microscopy.

The results of these analyses should not be used as a scope of work for abatement without consulting LAW.

These results may be subject to Quality Control (QC) analysis. Should the QC result in a change to these results, a separate report will be issued reflecting the change.

VA. LAB LICENSE #: 3333000010 NVLAP #: 101847

## **APPENDIX B**

### **LEAD-BASED PAINT SAMPLE ANALYSIS**

**Lead-Based Paint Sample Analysis**

| <b>Sample Number</b> | <b>Sampled Surface</b> | <b>Sample Location</b>            | <b>Results of Analysis Weight %</b> |
|----------------------|------------------------|-----------------------------------|-------------------------------------|
| MRP-01               | Paint, Light Green     | Harper House, South Gable         | 0.186                               |
| MRP-02               | Paint, Light Green     | Harper House, South Facia         | 0.611                               |
| MRP-03               | Paint, Light Green     | Harper House, West Dormer         | 0.464                               |
| MRP-04               | Paint, Light Green     | Harper House, West Window         | 0.238                               |
| MRP-05               | Paint, Light Green     | Wager House, West Door Casing     | 0.677                               |
| MRP-06               | Paint, Light Green     | Wager House, West Dormer          | 0.289                               |
| MRP-07               | Paint, Light Green     | Wager House, West Facia           | 0.870                               |
| MRP-08               | Paint, Light Green     | Tenant House 1C, West Dormer      | 0.704                               |
| MRP-09               | Paint, Black           | Tenant House 1C, West Gutter      | 9.07                                |
| MRP-10               | Paint, Light Green     | Tenant House 1C, West Window      | 1.26                                |
| MRP-11               | Paint, Black           | Tenant House 1D, West Gutter      | 7.96                                |
| MRP-12               | Paint, Light Green     | Tenant 1D, West Window            | 0.664                               |
| MRP-13               | Paint, Ligh Green      | Tenant House 1C, West Door Casing | 1.21                                |
| MRP-14               | Paint, Light Green     | Tenant House 1D, West Door Casing | 1.12                                |

## **APPENDIX C**

### **ANNOTATED DRAWINGS SHOWING SAMPLE LOCATIONS**



## LEGEND

- SAMPLE LOCATION
- MRP MARMON ROW PAINT SAMPLE
- MRA MARMON ROW ASBESTOS SAMPLE

NOTE: DRAWING NOT TO SCALE

MARION ROW BUILDING  
HARPERS FERRY  
NATIONAL HISTORIC PARK  
HARPERS FERRY, WV



LAW  
ENGINEERING AND ENVIRONMENTAL SERVICES

NOTE:  
ALONG "PUBLIC WAY" STREET  
LOWER TOWN HALL/NPS.

ASBESTOS AND LEAD-BASED  
PAINT SAMPLE LOCATION

PROJECT NO.  
20340-6-1111

FIGURE 1