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gwinnettcounty

March 10, 2014

ADDENDUM #1

BL017-14

North Chattahoochee Interceptor Pumping Station Electrical Rehab Project

This addendum is being issued to provide clarification and answer questions received.

- C1. As stated in the original bid notice, a pre-bid conference will be held at 10:00am on March 11th with a site visit to follow. However, it has been requested that an additional site visit be provided. A second site visit will take place on March 14, 2014 at 10:00am. The second site visit will not be a time for asking questions. Any questions that are a result of the second site visit must be emailed to Holly Cafferata by the question deadline.
- C2. The question deadline has been extended to March 14, 2014 at 5:00pm.
- C3. Specification Section 01 14 00 Unique Requirements, 3.07 D., DELETE paragraph 1 and replace it with “1. Inspection (survey) – A report of limited asbestos and lead-based paint surveys is provided as Appendix C.”
- C4. Specification Section 00 01 10 Table of Contents, add to the end of page 2:

“Appendix C Report of Limited Asbestos and Lead-Based Paint Surveys”

This addendum should be signed in the space provided below and returned with your bid. Failure to do so may result in your bid being deemed non-responsive.

Company Name _____

Authorized Representative _____

Thank you.

Holly Cafferata, CPPB
Purchasing Associate III



APPENDIX C

NORTH CHATTAHOOCHEE PUMPING STATION ELECTRICAL REHAB PROJECT

Prepared for
Gwinnett County, GA
February 2014

Report of Limited Asbestos and Lead-Based Paint Surveys

North Chattahoochee Interceptor

Electrical Rehabilitation

M- 0745.39

Gwinnett County Purchase Order No. 2000242764

4858 River Hollow Run
Duluth, Gwinnett County, Georgia 30096

March 4, 2014



**REPORT OF LIMITED ASBESTOS AND
LEAD-BASED PAINT SURVEYS**

North Chattahoochee Interceptor
Electrical Rehabilitation
M-0745.39
4858 River Hollow Run
Duluth, Gwinnett County, Georgia 30096

WILLMER ENGINEERING INC.
Willmer Project No. ATL-74.3952

Prepared For

Gwinnett County Department of Water Resources
684 Winder Highway
Lawrenceville, Georgia 30045-5012

Prepared By
Willmer Engineering Inc.
3772 Pleasantdale Road
Suite 165
Atlanta, Georgia 30340-4270
770.939.0089

March 5, 2014

VIA E-MAIL/U.S. MAIL

Mr. Tony Harris
Construction Manager
Gwinnett County Department of Water Resources
684 Winder Highway
Lawrenceville, Georgia 30045-5012

SUBJECT: Report of Limited Asbestos and Lead-Based Paint Surveys
North Chattahoochee Interceptor Electrical Rehabilitation
M-0745.39
4858 River Hollow Run
Duluth, Gwinnett County, Georgia 30096
Willmer Project No. ATL-74.3952

Dear Mr. Harris:

Willmer Engineering Inc. is pleased to submit this report of the surveys for asbestos-containing materials and lead-based paint for the proposed areas scheduled for demolition and rehabilitation at the North Chattahoochee Inceptor (NCI). Our work was conducted in accordance with Willmer Proposal No. 14.P129 dated February 11, 2014. Work proceeded based on the approved Gwinnett County Purchase Order No. 2000242764 dated February 24, 2014.

We appreciate the opportunity to be of service to you on this project. If you have any questions regarding this report please contact Doris I. Willmer, PE at 770.939.0089 extension 24.

Sincerely,

WILLMER ENGINEERING INC.


Doris I. Willmer, PE, LEED® AP
Principal Consultant


James L. Willmer, PE
Principal Consultant

This original document was signed and sealed
by Doris I. Willmer, PE
Registration No. 10779 on March 5, 2014

**THIS REPRODUCTION IS NOT A CERTIFIED
DOCUMENT**

DIW/MS
P:13952 Gwinnett NCI Electrical Rehabilitation Reports



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Executive Summary

Willmer Engineering Inc. (Willmer) conducted limited asbestos and lead-based paint surveys at select locations for the rehabilitation of the roof and north and east portions of the existing NCI structure at 4858 River Hollow Run in Duluth, Gwinnett County, Georgia on February 18, 2014. The surveys were completed to determine the presence of asbestos-containing materials or lead-based paint on select components on the interior and exterior of the structure prior to planned electrical rehabilitation improvements to the building by the County. The following results of the surveys are:

- A total of twenty (20) bulk samples of suspect asbestos-containing materials (ACM) were collected by Willmer representatives and submitted to a certified laboratory for analysis. *All ACM samples were reported as non-detect for asbestos by the laboratory.*
- As a result of the hidden nature of many building components (i.e. within mechanical chases) and/or the result of previous renovations, there may be hidden materials such as floor tile, sheet vinyl flooring, etc. If any suspect ACM similar to materials tested for this survey are identified during demolition activities, Willmer should be contacted to conduct additional sampling and analyses of suspect materials to confirm the presence of asbestos prior to disturbance.
- A total of sixty-three (63) painted surfaces were tested for lead-based paint (LBP) using an X-ray fluorescence analyzer (XRF). The XRF sampling results are reported in milligrams per square centimeter (mg/cm^2). *LBP was not identified in any of the materials sampled.*
- Due to the inaccessibility of some building elements, it is conceivable that all potential LBP may not have been located and identified. If, during demolition activities, additional suspect LBP is revealed, Willmer should be contacted to conduct sampling and analyses prior to disturbance.



1.0 Project Description

A limited ACM survey and a limited LBP survey were conducted at the NCI structure located at 4858 River Hollow Run, Duluth, Gwinnett County, Georgia 30619 (Figure 1). Mr. Tony Harris, Construction Manager of the Gwinnett County Department of Water Resources requested Willmer conduct these surveys prior to the planned rehabilitation activities. The project scope included limited ACM and LBP surveys at select locations for the rehabilitation planned for only the roof and north and east portions of the existing NCI structure. The surveys were completed at the building on February 18, 2014. All activities were coordinated through our designated contact, Mr. Harris.

The NCI building is a single-story steel frame and exterior wall industrial-type warehouse structure resting on a slab on grade concrete foundation. The flat roof is comprised of a metal roofing system supported by steel beams. Interior finishes include metal walls, caulking and insulation. The floor is concrete throughout the building area.

The asbestos and lead-based paint surveys were conducted by Willmer representatives Ms. Allyson Bowen, asbestos inspector, and Mr. Douglas Campbell, lead-based paint inspector. These individuals are certified to conduct asbestos and lead-based paint inspections in Georgia. Copies of their certifications are included in Appendix I. A copy of Willmer Engineering Inc.'s lead-based paint firm license is also included.



2.0 Limited Asbestos Survey

2.1 Background

Willmer completed the ACM survey following National Emission Standard for Hazardous Air Pollutants (NESHAP) protocols. Suspect ACM were identified based on the experience of the inspector, those materials listed in the U.S. Environmental Protection Agency (EPA) document of June 1985, Guidance for Controlling Asbestos-Containing Materials in Buildings, and those materials targeted for demolition. The Willmer representative conducted the survey using methodology in accordance with prevailing industry standards.

A group of six commercial fibrous silicate minerals are defined collectively as asbestos: Chrysotile (a serpentine mineral), Crocidolite, Amosite, Anthophyllite, Tremolite, and Actinolite (amphiboles). Asbestos products are inherently noncombustible and make excellent thermal insulators, are effective at condensate control and are resistant to corrosive chemicals. Greater than 3,600 asbestos-containing commercial and consumer products have been identified. Flooring products, asbestos cement pipes, roofing products, friction products, asbestos cement sheets, packing and gaskets, insulation, paper products, textiles, etc. represent some of the majority of asbestos production.

ACM are divided into one of two categories, based upon their physical characteristics. Friable materials are those that may be crushed or pulverized to powder by hand pressure. These materials are the most dangerous type because the asbestos fibers could be released by casual contact. Friable materials include mechanical system and fireproofing insulations, ceilings and decorative finishes. Non-friable materials are those that resist hand pressure. These materials are considered less hazardous than friable materials. Non-friable materials still may release asbestos fibers if improperly handled or disposed. Also, the physical condition of a non-friable material could change over time. Asbestos was banned from all sprayed and troweled-on applications of asbestos, such as sprayed-on fireproofing and decorative materials, acoustical materials and thermal system insulation through 1978. Some consumer products and building materials (such as flooring, mastics, etc.) not subject to the Toxic Substances Control Act Ban and Phase-out Rule of 1989 contain ACM, and remain in use.

2.2 Methodology

The limited asbestos survey was performed by visually observing accessible areas of the building for materials likely to contain asbestos mineral fibers. An EPA accredited building inspector performed the visual observations (see personnel qualifications in Appendix I). The asbestos survey consisted of three basic procedures: 1) conducting a visual inspection of the building; 2) identifying homogeneous areas of suspect surfacing, thermal system insulation, and miscellaneous materials; and 3) sampling accessible, friable and non-friable suspect materials. Materials visibly identified as non-asbestos (fibrous glass, foam, rubber, woods, etc.) were not sampled.

Both friable and non-friable materials were sampled. After the overall visual survey was completed, representative sampling areas were determined. The inspector delineated homogeneous areas of suspect materials and samples of each material were obtained to generally comply with NESHAP and OSHA regulations. Bulk samples of suspect ACM were collected, placed into individual containers and hand delivered under chain of custody to Analytical Environmental Laboratories, Inc. (AES) in Atlanta, Georgia for analysis. Rush sampling with a turnaround time of 24 hours was requested. AES is



accredited by NIST's National Voluntary Accreditation Program (NVLAP) for Polarized Light Microscopy (PLM) analysis, Lab Code 102082-0.

Homogenous Areas

Homogeneous areas (HA) were identified prior to collecting any samples to develop a sampling strategy. A homogeneous sampling area can be described as one or more areas of material that are similar in appearance and texture and that have the same installation date and function. Homogenous areas were established for the areas inspected and included in this survey. The actual number of samples collected from each homogeneous sampling area varied, based on the type of material, accessibility to the sample and the professional judgment of the inspector.

Each material selected was further classified into one of three categories. Appropriate sampling requirements are applied to each category.

- Surfacing Materials: Spray-applied or troweled surfaces, such as plaster ceilings and walls, fireproofing, textured paints, textured plasters and spray-applied acoustical surfaces.
- Thermal System Insulation: Insulation used to inhibit heat gain or loss on pipes, boilers, tanks, ducts, and various other building components.
- Miscellaneous Materials: Friable and non-friable products and materials that do not fit in the above two categories, such as 1) caulking, 2) glazing, 3) siding, 4) resilient floor covering, 5) baseboards, 6) mastics, 7) adhesives and 8) roofing material. Wallboard and ceiling tile are included in this category.

Since no ACM was detected, no assessment of their condition as good, damaged, or significantly damaged per Title 40 Code of Federal Regulations Part 763 was made. Material with localized significant damage was also assessed when observed. A physical assessment includes evaluating the condition, assessing the potential for disturbance, and determining the friability of each material.

Sampling Strategy

For the purpose of this report, ACM are defined as any material product used in the construction of the building that contains greater than (>) 1% asbestos, by weight. NESHAP material categories include: 1) regulated friable and non-friable ACM that may become friable during renovation/demolition activity (RACM); 2) Category I non-friable ACM (roofing, flooring, mastics, gaskets); and 3) Category II non-friable ACM (all other materials including asbestos cement products). The actual collection of a bulk asbestos sample involves the removal of a small piece of material and placing it in a marked airtight container. Each sample container is marked with an identification number that matches the field chain of custody.

2.3 Laboratory Analysis

Analysis of bulk samples for asbestos content was performed utilizing polarized light microscopy (PLM) combined with dispersion staining (PLM/ds), in general accordance with EPA 600/M-4-82-020, according to the guidelines set forth in the U.S. EPA document, *Interim Methods for the Determination of Asbestos in Bulk Insulation Samples*, as defined in 40 CFR 763, Appendix A to Subpart F. Bulk samples were initially



examined under a stereo-binocular microscope and PLM/ds, and then selected components were mounted in specific refractive index oils for analysis. All suspect materials were submitted for laboratory testing. EPA and Georgia regulations require that a material be classified as ACM if *any* layer present contains > 1% asbestos. OSHA regulations for worker protection apply to asbestos content less than or equal to (\leq) 1% in any layer. Layered samples commonly present include thermal system insulation, resilient floor covering, roofing materials, textured ceilings and wallboard.

Asbestos fibers can be present as an impurity in a product or as a main constituent. The quantity of asbestos fibers in a material is also variable within a batch or manufactured quantity of the same material. The asbestos content determined for the samples only represents the amount of asbestos at the point of collection. The amount of asbestos identified in a sample of ACM may vary depending on sample location.

2.4 Findings

A Willmer representative, Ms. Allyson Bowen, collected twenty (20) bulk samples from the materials observed representing 7 different homogenous areas. Samples were analyzed by PLM based on the distinct number of layers (materials) associated with each bulk sample. The materials sampled for this project included expansion joints, wall systems, pipe caulking and roof caulking at various locations throughout the building in the areas designated for rehabilitation. The structure has a metal roof; therefore, no sample for asbestos testing was retrieved from the roof.

No asbestos was detected in any of the materials sampled. If other areas of the structure not sampled are disturbed, Willmer should be contacted to inspect those areas that were not contained in the original project scope.

Appendix II presents pictures identifying the asbestos sample locations throughout the structure. Appendix III contains the chain of custody for the asbestos samples analyzed and the results of laboratory testing.

Table 1 summarizes the materials sampled, sample locations, and analytical results as identified by the field sampler at the time of sample collection.

2.5 Conclusions and Recommendations

The results of the limited asbestos survey of the NCI building indicate that none of the accessible suspect materials sampled contained asbestos at greater than 1%. Hence, by definition, no ACM was found. The ACM survey was limited to physically accessible and exposed areas. As a result of the hidden nature of many building components (i.e. within mechanical chases) and/or the result of previous renovations, there may be hidden materials such as floor tile, sheet vinyl flooring, etc. These materials may be found in various areas hidden under existing flooring materials. If any suspect ACM is identified during demolition activities, Willmer should be contacted to conduct additional sampling and analyses of suspect materials to confirm the presence of asbestos prior to disturbance.



3.0 Limited Lead-Based Paint Survey

3.1 Background

Three primary regulatory agencies that control lead exposure to humans are the U.S. Environmental Protection Agency (EPA - environmental protection), the U.S. Department of Housing and Urban Development (HUD-low income housing stock) and the Occupational Safety and Health Administration (OSHA-worker protection).

The rules and regulations promulgated by these agencies direct the sampling, testing and control of lead-based paints in their respective regulatory environments. The EPA and HUD Federal definition of LBP is greater than or equal to (\geq) 1.0 milligrams per square centimeter (mg/cm^2) by X-ray fluorescent analyzer or laboratory testing, or $\text{LBP} \geq 0.5\%$ or 5000 parts per million (ppm) by laboratory analysis. Additionally, the Consumer Product Safety Commission's (CPSC) definition of lead is $\geq 0.06\%$ or 600 ppm.

OSHA Lead Exposure in Construction 29 CFR 1926.62 applies to all construction work where an employee may be occupationally exposed to lead at any detectable level. According to OSHA Lead Exposure in Construction 29 CFR 1926.62, the employer shall assure that no employee is exposed to lead at concentrations greater than the permissible exposure limit (PEL) of 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) as an 8-hour time weighted averaged (TWA). OSHA requires monitoring the employee's blood lead level (BLL) if exposure to airborne lead is at or above the action level (AL) of $30 \mu\text{g}/\text{m}^3$ as an 8-hour TWA. The standard specifies the temporary medical removal of employees whose BLL is equal to or greater than 40 micrograms per deciliter ($\mu\text{g}/\text{dL}$).

3.2 Methodology

The lead-based paint survey consisted of three basic procedures: 1) conducting a visual inspection of the structure; 2) identifying homogeneous areas of suspect paint; and 3) sampling physically accessible suspect materials.

The limited LBP survey was conducted to determine the presence or absence of LBP on accessible painted surfaces prior to demolition of the building. The limited LBP survey followed industry accepted protocols and testing methodology. The building was visually surveyed by Willmer representative, Mr. Douglas Campbell, licensed lead inspector in Georgia. Specific sampling protocols consisted of a modified version of the methodology established by The Department of Housing and Urban Development (HUD). Figure 2 illustrates the building areas used in the sampling protocol. Protocols were modified to accomplish the specific goals of this project. Only the roof and north and east portions of the building were tested as highlighted in Figure 2.

Testing of the painted surfaces was accomplished using a Niton Model XLp 303A XRF Analyzer, Serial No. 7653 (see Appendix V for the Performance Characteristic Sheet of the instrument). HUD recommends this screening method for analysis of lead paint levels. The exact number of testing locations per area may vary depending upon existing conditions. The XRF instrument exposes the painted surface to gamma radiation, causing the irradiated substance to emit a spectrum of characteristic frequencies. The frequencies which are characteristic of lead are singled out and measured by the instrument and converted into a number representing the amount of lead in the paint per unit area. The unit of measurement used in XRF analysis is milligrams per square centimeter (mg/cm^2). XRF analyzer readings



equal to or greater than (\geq) 1.0 mg/cm² are considered positive under U.S. EPA, Georgia EPD and HUD regulations.

A total of sixty-three (63) readings of various suspect painted surfaces were collected using the XRF analyzer. Typical surfaces tested included; walls, wall trim, doors, door frames, door jambs, door hinges, door trim, door casings, door stops, gutters, down spouts, electrical and switch boxes, conduit, lights, roof, roof support, ridge beams and HVAC unit components and baseboards. Appendix IV presents the XRF results of the lead tested paint survey.

3.3 Findings

No results exceed the current regulatory level of LBP which is equal to or greater than (\geq) 1.0 mg/cm².

Readings of components that contain lead with concentrations of lead less than 1.0 mg/cm² are not LBP; however, they are considered to be lead-containing. OSHA states that if lead is detectable at any level, then adequate worker protection must be provided when disturbing these materials. *No lead containing components were identified.*

3.4 Conclusions and Recommendations

No readings of the total 63 XRF analyzer readings obtained throughout the building were equal to or greater than the current HUD regulatory limit of 1.0 mg/cm².

Due to the inaccessibility of some building elements, it is conceivable that all potential LBP may not have been located and identified. Our investigation and methodology reflect our best efforts based upon the prevailing standard of care for LBP studies. If additional suspect materials are identified during renovation activities, Willmer should be contacted to determine the need for additional LBP testing prior to disturbance.

TABLE

Bulk Sample Summary



Table 1
Bulk Sample Summary
NCI Electrical Rehabilitation
M – 0745.39
4858 River Hollow Run
Duluth, GA 30096
Willmer Project No. ATL-74.3952

Homogeneous Area Sample No.	Sample Description	Sample Location	% Asbestos Content ¹	NF/F ²	Cat. I/II ³	RACM Y/N ⁴
EJ-01-01-02	Expansion Joint	North and East Perimeter Floor	NAD ⁵	N/A	N/A	N/A
WS-01-01-03	Wall Systems	Right North Wall, Left North Wall, Middle East Wall	NAD	N/A	N/A	N/A
EC-01-01-03	Exterior Caulk	Pipes on East Wall (White Caulk)	NAD	N/A	N/A	N/A
EC-02-01-03	Exterior Caulk	Pipes on East Wall (Black Caulk)	NAD	N/A	N/A	N/A
EC-03-01-03	Exterior Caulk	Pipes on East Wall attached to Structure (Tan Caulk)	NAD	N/A	N/A	N/A
EC-04-01-03	Exterior Caulk	Roof (Gray Caulk)	NAD	N/A	N/A	N/A
EC-05-01-03	Exterior Caulk	Roof (White Caulk)	NAD	N/A	N/A	N/A

Notes:

¹Asbestos mineral percentage

²NF=Non – Friable Material, F= Friable Material

³CAT. I=Category I non-friable asbestos-containing material (ACM means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos and determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy.

³CAT. II=Category II non-friable ACM means any material, excluding Category I non-friable ACM, containing more than 1 percent asbestos as determined using the methods specified in Appendix A, Subpart F, 40 CFR Part 763 Section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

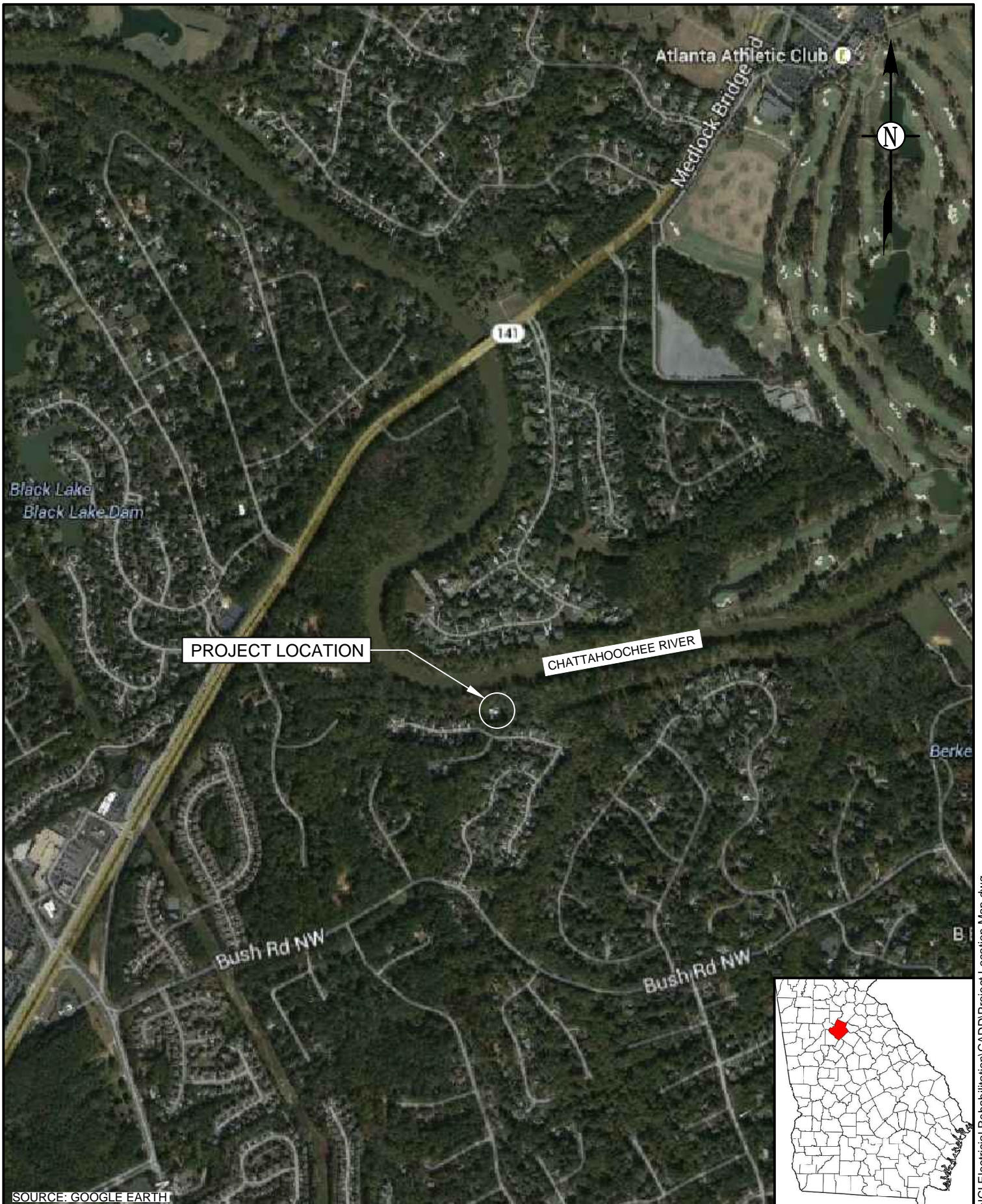
⁴RACM=Regulated asbestos-containing material (a) Friable asbestos material, (b) Category I non-friable ACM that has become friable, (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II non-friable ACM that has a high probability of becoming or has come crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this subpart.

⁵NAD=No Asbestos Detected

FIGURES

Project Location Map

Property Location Map



SOURCE: GOOGLE EARTH

SCALE: 1" = 1000'

DATE: 3/3/2014

DRAWN BY: ZMH

REVIEWED BY: DW

WILLMER ENGINEERING INC.



GEOTECHNICAL ENGINEERING
 CONSTRUCTION SERVICES
 ENVIRONMENTAL SERVICES AND ENGINEERING
 3772 PLEASANTDALE ROAD - SUITE 165
 ATLANTA, GA 30340-4270

FIGURE 1

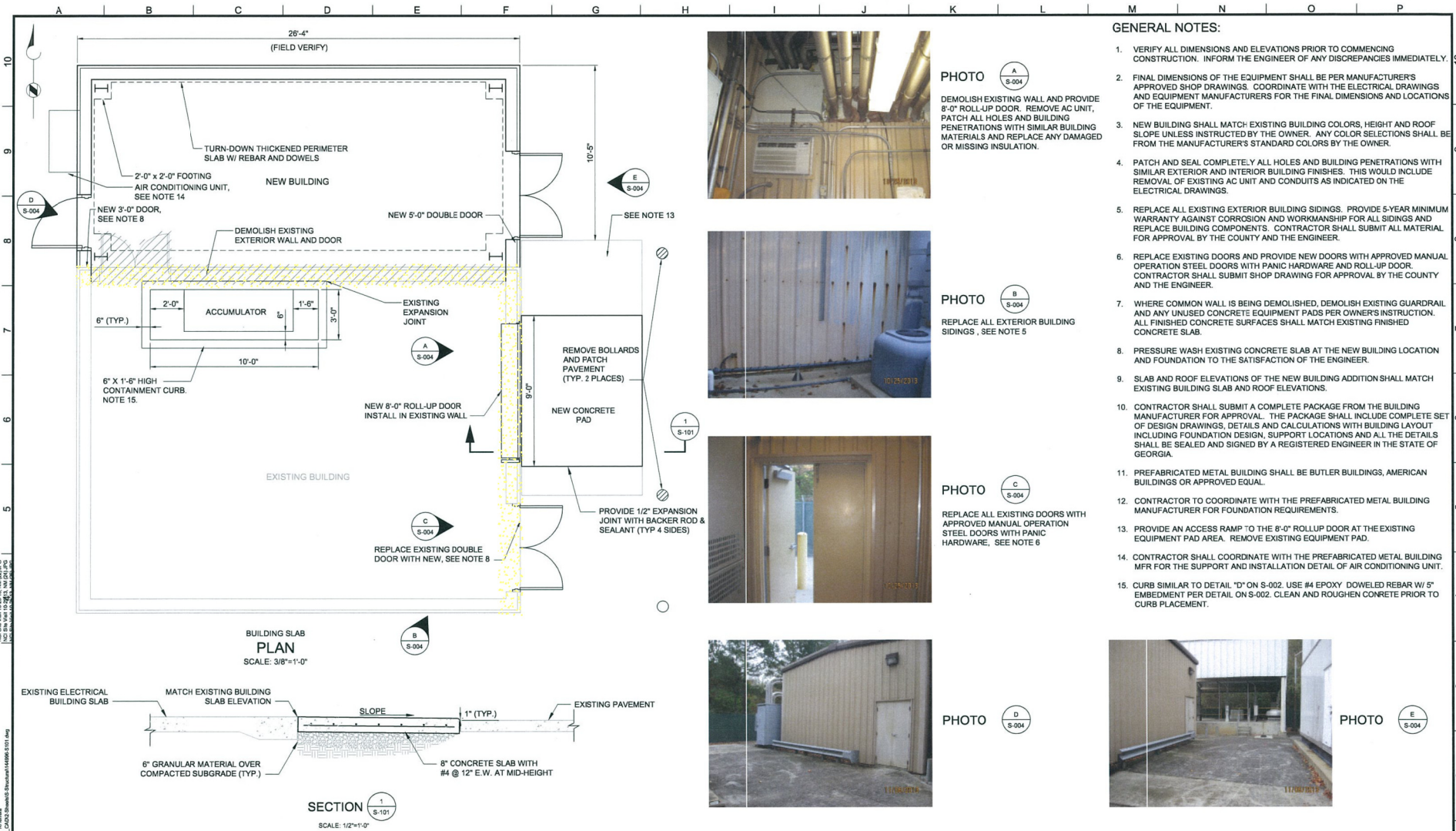
PROJECT LOCATION MAP

NCI ELECTRICAL REHABILITATION #M-0745.39

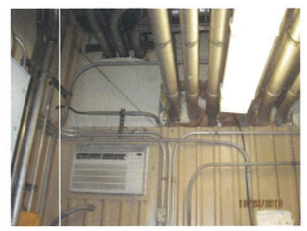
4858 RIVER HOLLOW RUN

DULUTH, GWINNETT COUNTY, GEORGIA. 30096

WILLMER PROJECT No. 74.3952



- GENERAL NOTES:**
1. VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO COMMENCING CONSTRUCTION. INFORM THE ENGINEER OF ANY DISCREPANCIES IMMEDIATELY.
 2. FINAL DIMENSIONS OF THE EQUIPMENT SHALL BE PER MANUFACTURER'S APPROVED SHOP DRAWINGS. COORDINATE WITH THE ELECTRICAL DRAWINGS AND EQUIPMENT MANUFACTURERS FOR THE FINAL DIMENSIONS AND LOCATIONS OF THE EQUIPMENT.
 3. NEW BUILDING SHALL MATCH EXISTING BUILDING COLORS, HEIGHT AND ROOF SLOPE UNLESS INSTRUCTED BY THE OWNER. ANY COLOR SELECTIONS SHALL BE FROM THE MANUFACTURER'S STANDARD COLORS BY THE OWNER.
 4. PATCH AND SEAL COMPLETELY ALL HOLES AND BUILDING PENETRATIONS WITH SIMILAR BUILDING MATERIALS AND REPLACE ANY DAMAGED OR MISSING INSULATION.
 5. REPLACE ALL EXISTING EXTERIOR BUILDING SIDINGS. PROVIDE 5-YEAR MINIMUM WARRANTY AGAINST CORROSION AND WORKMANSHIP FOR ALL SIDINGS AND REPLACE BUILDING COMPONENTS. CONTRACTOR SHALL SUBMIT ALL MATERIAL FOR APPROVAL BY THE COUNTY AND THE ENGINEER.
 6. REPLACE EXISTING DOORS AND PROVIDE NEW DOORS WITH APPROVED MANUAL OPERATION STEEL DOORS WITH PANIC HARDWARE AND ROLL-UP DOOR. CONTRACTOR SHALL SUBMIT SHOP DRAWING FOR APPROVAL BY THE COUNTY AND THE ENGINEER.
 7. WHERE COMMON WALL IS BEING DEMOLISHED, DEMOLISH EXISTING GUARDRAIL AND ANY UNUSED CONCRETE EQUIPMENT PADS PER OWNER'S INSTRUCTION. ALL FINISHED CONCRETE SURFACES SHALL MATCH EXISTING FINISHED CONCRETE SLAB.
 8. PRESSURE WASH EXISTING CONCRETE SLAB AT THE NEW BUILDING LOCATION AND FOUNDATION TO THE SATISFACTION OF THE ENGINEER.
 9. SLAB AND ROOF ELEVATIONS OF THE NEW BUILDING ADDITION SHALL MATCH EXISTING BUILDING SLAB AND ROOF ELEVATIONS.
 10. CONTRACTOR SHALL SUBMIT A COMPLETE PACKAGE FROM THE BUILDING MANUFACTURER FOR APPROVAL. THE PACKAGE SHALL INCLUDE COMPLETE SET OF DESIGN DRAWINGS, DETAILS AND CALCULATIONS WITH BUILDING LAYOUT INCLUDING FOUNDATION DESIGN, SUPPORT LOCATIONS AND ALL THE DETAILS SHALL BE SEALED AND SIGNED BY A REGISTERED ENGINEER IN THE STATE OF GEORGIA.
 11. PREFABRICATED METAL BUILDING SHALL BE BUTLER BUILDINGS, AMERICAN BUILDINGS OR APPROVED EQUAL.
 12. CONTRACTOR TO COORDINATE WITH THE PREFABRICATED METAL BUILDING MANUFACTURER FOR FOUNDATION REQUIREMENTS.
 13. PROVIDE AN ACCESS RAMP TO THE 8'-0" ROLLUP DOOR AT THE EXISTING EQUIPMENT PAD AREA. REMOVE EXISTING EQUIPMENT PAD.
 14. CONTRACTOR SHALL COORDINATE WITH THE PREFABRICATED METAL BUILDING MFR FOR THE SUPPORT AND INSTALLATION DETAIL OF AIR CONDITIONING UNIT.
 15. CURB SIMILAR TO DETAIL "D" ON S-002. USE #4 EPOXY DOWELED REBAR W/ 5" EMBEDMENT PER DETAIL ON S-002. CLEAN AND ROUGHEN CONCRETE PRIOR TO CURB PLACEMENT.



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The Environmental Institute

Allyson Bowen

Social Security Number - XXX-XX-7644

National Environmental Solutions - P. O. Box 220 - Sautee-Nacoochee, Georgia 30571

*Has completed coursework and satisfactorily passed
an examination that meets all criteria required for
EPA/AHERA/ASHARA (TSCA Title II) Approved Accreditation*

Asbestos in Buildings: Inspection and Assessment

December 2-4, 2013

Course Date

4590

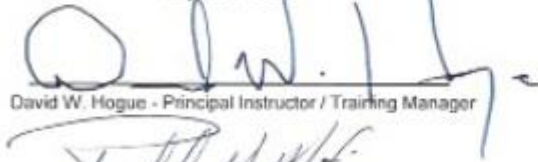
Certificate Number

December 4, 2013

Examination Date

December 3, 2014

Expiration Date



David W. Hogue - Principal Instructor / Training Manager



Rachel G. McCain - Exam Administrator



(Approved by the ABIH Certification Maintenance Committee for 3 CM points - Approval #11-529)
(Florida Provider Registration Number FL49-0001342 - Course #FL49-0004700)

TEI - 1841 West Oak Parkway, Suite F - Marietta, Georgia 30062 - (770) 427-3600 - www.tei-atl.com

Georgia Environmental Protection Division

Lead-Based Paint and Asbestos Program

Certification, Accreditation, Licensing Unit

Judson H. Turner, Director

4244 International Parkway, Suite 104

Atlanta, Georgia 30354



Certification To Conduct Georgia Regulated Lead-Based Paint Activities

Discipline Certification Type Inspector Only

Certification Number 60 INSO 1013 2512

Issued To: Douglas Campbell

Gender	Height	Weight	Date of Birth
Male	6 1	160	1/26/1970

Company

National Environmental Solutions, Inc.

Address

273 Quail Run

City	State	Zip	Phone
Sautee-Nacoochee	Georgia	30571	(678) 524-0203

Certification Issue Date	Certification Expiration Date	Last Date Of Training
10/29/2013	10/28/2014	10/28/2011

This certificate confers all authorities granted by Georgia EPD Rules 381-3-24 and allows the above named individual to serve as a(n)

Inspector Only

This certificate must be in your possession while conducting activities regulated by Georgia Rules 381-3-24. This certification is only valid for the performance of Georgia regulated lead-based paint activities and when employed by a Georgia Certified Lead-Based Paint Firm. A renewal application must be submitted at least thirty (30) days prior to the expiration date shown, and a refresher training course must be taken before the last date of training.

Issue Date	Expiration Date
10/29/2013	10/28/2014
Georgia Lead Firm License Number	
60 INSO	1013 47

Jennifer Vogel, Program Manager
Lead-Based Paint and Asbestos Program
(404) 363-7026
Issued By Alosie Larkins





**Georgia Environmental Protection Division
Lead-Based Paint Certified Firm License**



Jason H. Turner, Director
4244 International Parkway, Suite 104
Atlanta, Georgia 30354

This Is To Certify That

National Environmental Solutions, Inc. (NESI)

Beverly B. Campbell

Owner/President

Having Satisfied the Requirements of The Georgia Lead Poisoning Prevention Act, O.C.G.A. 31-41-1, et seq and the Rules for Lead-Based Paint Hazard Management, Chapter 391-3-24, The Above Referenced Firm Is Hereby Certified To Perform Lead-Based Paint Activities In the State of Georgia. This License May Be Subject to Revocation, Suspension, or Modification by the Director for Cause Including Evidence of Noncompliance or For Any Misrepresentation Made in the Application, Supporting Data or Subsequent Submittals Entered Therein or Attached Thereto, or Failed to Maintain Required Records. The Certification Holder Agrees to Use Only Georgia Certified Individuals When Conducting Georgia Regulated Lead-Based Paint Activities Granted By This License.

<i>Issue Date</i>	<i>Expiration Date</i>
2/19/2014	2/19/2015

<i>Georgia Lead Firm License Number</i>	12 - 0002 - 2225
---	------------------



Jennifer Vogel

*Jennifer Vogel, Program Manager
Lead-Based Paint and Asbestos Program
(404) 363-7026*

Issued By: Aljose Larkins



Georgia Environmental Protection Division Lead-Based Paint Certified Firm License



Judson H. Turner, Director

4244 International Parkway, Suite 104
Atlanta, Georgia 30354

This Is To Certify That

Willmer Engineering, Inc.

Doris Willmer

Owner/President

Having Satisfied the Requirements of The Georgia Lead Poisoning Prevention Act, O.C.G.A. 31-41-1, et seq and the Rules for Lead-Based Paint Hazard Management, Chapter 391-3-24, The Above Referenced Firm is Hereby Certified To Perform Lead-Based Paint Activities in the State of Georgia. This License May Be Subject to Revocation, Suspension, or Modification by the Director for Cause Including Evidence of Noncompliance or For Any Misrepresentation Made in the Application, Supporting Data or Subsequent Submittals Entered Therein or Attached Thereto, or Failed to Maintain Required Records. The Certification Holder Agrees to Use Only Georgia Certified Individuals When Conducting Georgia Regulated Lead-Based Paint Activities Granted By This License.

<i>Issue Date</i>	<i>Expiration Date</i>
11/15/2013	11/15/2014
<i>Georgia Lead Firm License Number</i>	
12	0799 2263



Jennifer Vogel

***Jennifer Vogel, Program Manager
Lead-Based Paint and Asbestos Program
(404) 363-7026***

Issued By: Aljosie Larkins

APPENDIX II

Asbestos Sample Locations



Photograph No. 1: EJ-01-01 through 02: All
Perimeter Flooring
No Asbestos Detected



Photograph No. 2: WS-01-01 through 03: All
Upper Wall Systems
No Asbestos Detected



Photograph No. 3: EC-01-01 through 03:
Pipes on East Wall (White Caulk) EC-02-01
through 03: Pipes on East Wall (Black Caulk)
No Asbestos Detected



Photograph No. 4: EC-03-01 through 03:
Pipes on East Wall Attached to Structure
No Asbestos Detected



Photograph No. 5: EC-04-01 through 03:
Roof (Gray Caulk)
EC-05-01 through 03: Roof (White Caulk)
No Asbestos Detected



Photograph No. 6: NCI Exterior

APPENDIX III

Bulk Sample Summary Report and Chain of Custody

ANALYTICAL ENVIRONMENTAL SERVICES, INC.
 3785 Presidential Pkwy., Atlanta, GA 30340-3704
 (770) 457-8177 / Toll Free (800) 972-4889 / Fax (770) 457-8188

**CHAIN OF CUSTODY
 BULK ASBESTOS ANALYSIS**

1402017

Client Name: NEI Phone: () _____
 Address: P.O. Box 220 Fax: () _____
 City, State, Zip: Lawville, GA 30571 Project Name: _____
 Contact: Beverly Campbell Project Number: 14-2200
 Sampler's Name: Ally Bowen & Dany Campbell Sampling Date: 2/18/2014

Sample ID	Sample Location/Description	Analysis Requested	Turnaround Time	Comments	For AES Use Only
1 EJ-01-01	EXPANSION JOINT EAST FLOOR (PLM)	PLM	24 hr.	Pos. Stop on.	
2 -02	NORTH FLOOR			H.A.	
3 WS-01-01	WALL SYSTEMS R. NORTH WALL				
4 -02	L. NORTH WALL				
5 -03	MID. EAST WALL				
6 EC-01-01	EXTERIOR CAULK PIPE EAST WALL				
7 -02	(WHITE)				
8 -03					
9 -02-01	EXTERIOR CAULK PIPE EAST WALL				
10 -02	(BLACK)				
11 -03					
12 -03-01	EXTERIOR CAULK PIPE ON EAST WALL				
13 -02	(TAN) ATTACHED TO STRUCTURE				
14 -03					
15 -04-01	EXTERIOR CAULK ROOF				
16 -02	(GRAY)				
17 -03					
18 -05-01	EXTERIOR CAULK ROOF				
19 -02	(WHITE)				
20 -03					

Relinquished by: Ally Bowen Date/Time: 2/18/2014 1:45
 Received by: _____ Date/Time: _____
 Relinquished by: _____ Date/Time: _____
 Received by: _____ Date/Time: _____

FOR LAB USE ONLY

Lab Recipient: Cathy R Date/Time: 2/18/14 1:45 Method of Shipment: client



ANALYTICAL ENVIRONMENTAL SERVICES, INC.
Bulk Sample Summary Report



Lab Code 102082-0
 19-Feb-14

Client Name: National Environmental Solutions, Inc.		AES Job Number: 1402D17							
Project Name: 14-2206		Project Number: 14-2206							
Client ID	AES ID	Location	Asbestos Mineral Percentage						Comments
			CH	AM	CR	AN	TR	AC	
ES-01-01 Layer: 1	1402D17-001A	Expansion Joint / East Floor (Wall)	ND	ND	ND	ND	ND	ND	Point included as binder
ES-01-02 Layer: 1	1402D17-002A	Expansion Joint / North Floor (Wall)	ND	ND	ND	ND	ND	ND	
ES-01-02 Layer: 2	1402D17-002A	Expansion Joint / North Floor (Wall)	ND	ND	ND	ND	ND	ND	
WS-01-01 Layer: 1	1402D17-003A	Wall Systems / R. North Wall	ND	ND	ND	ND	ND	ND	Point included as binder
WS-01-01 Layer: 2	1402D17-003A	Wall Systems / R. North Wall	ND	ND	ND	ND	ND	ND	
WS-01-02 Layer: 1	1402D17-004A	Wall Systems / L. North Wall	ND	ND	ND	ND	ND	ND	Point included as binder

Note: CH=chrysotile, AM=amosite, CR=crocidolite, AC=actinolite, TR=tremolite, AN=anthophyllite
 For comments on the samples, see the individual analysis sheets.
 ND = None Detected

AES, Inc. is accredited by NIST's National Voluntary Laboratory Accreditation Program (NVLAP) for Polarized Light Microscopy (PLM) analysis, Lab Code 102082-0. All analyses performed in accordance with EPA "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" (EPA 600/4-82-020), 1982 as found in 40 CFR, Part 763, Appendix E to Subpart E and "Method for the Determination of Asbestos in Bulk Building Materials" (EPA-600/R-99/116), 1993.
 These test results apply only to those samples actually tested, as submitted by the client. All percentages are reported by visually estimated volume.
 PLM is not consistently reliable in detecting small concentrations of asbestos in floor tiles and similar nonfriable materials, quantitative TEM is currently the only method that can be used to determine conclusive asbestos content.
 This report must not be reproduced except in full without written approval of Analytical Environmental Services, Inc.

Microanalyst:


Elena Ivanova

QC Analyst:

Yelena Khanina



ANALYTICAL ENVIRONMENTAL SERVICES, INC.
Bulk Sample Summary Report


 Lab Code 102082-0
 19-Feb-14

Client Name: National Environmental Solutions, Inc.	AES Job Number: 1402D17
Project Name: 14-2206	Project Number: 14-2206

Client ID	AES ID	Location	Asbestos Mineral Percentage						Comments
			CH	AM	CR	AN	TR	AC	
WS-01-02 Layer: 2	1402D17-004A	Wall Systems / L. North Wall	ND	ND	ND	ND	ND	ND	
WS-01-03 Layer: 1	1402D17-005A	Wall Systems / Mid East Wall	ND	ND	ND	ND	ND	ND	Paint included as binder
WS-01-03 Layer: 2	1402D17-005A	Wall Systems / Mid East Wall	ND	ND	ND	ND	ND	ND	
EC-01-01 Layer: 1	1402D17-006A	Exterior Cmlk / Piped East Wall (White)	ND	ND	ND	ND	ND	ND	
EC-01-02 Layer: 1	1402D17-007A	Exterior Cmlk / Piped East Wall (White)	ND	ND	ND	ND	ND	ND	
EC-01-03 Layer: 1	1402D17-008A	Exterior Cmlk / Piped East Wall (White)	ND	ND	ND	ND	ND	ND	

Note: CH=chrysotile, AM=amosite, CR=crocidolite, AC=actinolite, TR=tremolite, AN=anthophyllite
 For comments on the samples, see the individual analysis sheets.
 ND = None Detected

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 These test results apply only to those samples actually tested, as submitted by the client. All percentages are reported by visually estimated volume.
 PLM is not consistently reliable in detecting small concentrations of asbestos in floor tiles and similar nonfriable materials, quantitative TEM is currently the only method that can be used to determine conclusive asbestos content.
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Microanalyst:


 Elena Ivanova

QC Analyst:


 Yelena Khanna



ANALYTICAL ENVIRONMENTAL SERVICES, INC.
Bulk Sample Summary Report



Lab Code 102082-0
 19-Feb-14

Client Name: National Environmental Solutions, Inc.		AES Job Number: 1402D17							
Project Name: 14-2206		Project Number: 14-2206							
Client ID	AES ID	Location	Asbestos Mineral Percentage						Comments
			CH	AM	CR	AN	TR	AC	
EC-02-01 Layer: 1	1402D17-009A	Exterior Caulk / Piped East Wall (Black)	ND	ND	ND	ND	ND	ND	Point included as binder
EC-02-02 Layer: 1	1402D17-010A	Exterior Caulk / Piped East Wall (Black)	ND	ND	ND	ND	ND	ND	Point included as binder
EC-02-03 Layer: 1	1402D17-011A	Exterior Caulk / Piped East Wall (Black)	ND	ND	ND	ND	ND	ND	Point included as binder
EC-03-01 Layer: 1	1402D17-012A	Exterior Caulk / Pipes on East Wall (Tan) Attached Structure	ND	ND	ND	ND	ND	ND	Point included as binder
EC-03-02 Layer: 1	1402D17-013A	Exterior Caulk / Pipes on East Wall (Tan) Attached Structure	ND	ND	ND	ND	ND	ND	Point included as binder
EC-03-03 Layer: 1	1402D17-014A	Exterior Caulk / Pipes on East Wall (Tan) Attached Structure	ND	ND	ND	ND	ND	ND	Point included as binder

Note: CH=chrysotile, AM=amosite, CR=crocidolite, AC=actinolite, TR=trondhjemite, AN=anthophyllite
 For comments on the samples, see the individual analysis sheets.
 ND = None Detected

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 These test results apply only to those samples actually tested, as submitted by the client. All percentages are reported by visually estimated volume. PLM is not consistently reliable in detecting small concentrations of asbestos in floor tiles and similar nonfibrous materials, quantitative TEM is currently the only method that can be used to determine conclusive asbestos content.
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Microanalyst:

Elena Ivanova

QC Analyst:

Yelena Khayina



ANALYTICAL ENVIRONMENTAL SERVICES, INC.
Bulk Sample Summary Report



Lab Code 102082-0
 19-Feb-14

Client Name: National Environmental Solutions, Inc.	AES Job Number: 1402D17
Project Name: 14-2206	Project Number: 14-2206

Client ID	AES ID	Location	Asbestos Mineral Percentage						Comments
			CH	AM	CR	AN	TR	AC	
EC-04-01 Layer: 1	1402D17-015A	Exterior Caulk / Roof (Gray)	ND	ND	ND	ND	ND	ND	
EC-04-02 Layer: 1	1402D17-016A	Exterior Caulk / Roof (Gray)	ND	ND	ND	ND	ND	ND	
EC-04-03 Layer: 1	1402D17-017A	Exterior Caulk / Roof (Gray)	ND	ND	ND	ND	ND	ND	
EC-05-01 Layer: 1	1402D17-018A	Exterior Caulk / Roof (White)	ND	ND	ND	ND	ND	ND	
EC-05-02 Layer: 1	1402D17-019A	Exterior Caulk / Roof (White)	ND	ND	ND	ND	ND	ND	
EC-05-03 Layer: 1	1402D17-020A	Exterior Caulk / Roof (White)	ND	ND	ND	ND	ND	ND	Paint included as binder

Note: CH=chrysotile, AM=amosite, CR=crocidolite, AC=actinolite, TR=tremolite, AN=anthophyllite
 For comments on the samples, see the individual analysis sheets.
 ND = None Detected

AES, Inc. is accredited by NIST's National Voluntary Laboratory Accreditation Program (NVLAP) for Polarized Light Microscopy (PLM) analysis, Lab Code 102082-0. All analyses performed in accordance with EPA "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" (EPA 600/M4-82-020), 1982 as found in 40 CFR, Part 763, Appendix E to Subpart E and "Method for the Determination of Asbestos in Bulk Building Materials" (EPA/600/R-93/116), 1993.
 These test results apply only to those samples actually tested, as submitted by the client. All percentages are reported by visually estimated volume.
 PLM is not consistently reliable in detecting small concentrations of asbestos in floor tiles and similar nonfriable materials, quantitative TEM is currently the only method that can be used to determine conclusive asbestos content.
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Microanalyst:

Elena Ivanova

QC Analyst:

Yelena Khazina

APPENDIX IV

X-Ray Fluorescence (XRF) Analyzer Results

Reading No.	Time	Type	Duration	Units	Sequence	Component	Substrate	Sub	Condition	Color	Sta	Inspector	Floor	Room	Results	Depth Index	Action Level	PLC	PLC Error	PLC	PLC Error	PLC	PLC Error
676	2/8/14 10:19	SM7TRK_CAL	43.19	eps	Final													3.88	0	3.76	0	0.02	0
677	2/8/14 10:19	RMWT	19.84	mg/cm ²	Final						4050 RIVER HOLLOW	DOC			Positive	1.04	1	1	0.1	1	0.1	0.7	0.2
678	2/8/14 10:19	RMWT	19.85	mg/cm ²	Final						4050 RIVER HOLLOW	DOC			Positive	1.02	1	1	0.1	1	0.1	0.9	0.2
679	2/8/14 10:19	RMWT	19.84	mg/cm ²	Final						4050 RIVER HOLLOW	DOC			Positive	1.07	1	1	0.1	1	0.1	0.8	0.2
680	2/8/14 10:19	RMWT	1.1	mg/cm ²	Final	WALL	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.04	1.00
681	2/8/14 10:19	RMWT	1.1	mg/cm ²	Final	WALL/ASSH	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.82	1.00
682	2/8/14 10:19	RMWT	1.1	mg/cm ²	Final	DOOR	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.26	1.00
683	2/8/14 10:19	RMWT	1.1	mg/cm ²	Final	DOOR TRIM	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.42	1.00
684	2/8/14 10:19	RMWT	1.1	mg/cm ²	Final	DOOR CASE	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.05	2.40
685	2/8/14 10:19	RMWT	1.1	mg/cm ²	Final	WALLTRIM	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.69	1.00
686	2/8/14 10:19	RMWT	1.1	mg/cm ²	Final	DOOR STOP	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.41	2.00
687	2/8/14 10:41	RMWT	3.07	mg/cm ²	Final	LIGHT	METAL	NORTH	INTACT	BROWN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	4.34	1	4.08	0.66	0.02	0.05	-0.03	0.05
688	2/8/14 10:41	RMWT	1.1	mg/cm ²	Final	RIDGECAP	METAL	NORTH	INTACT	BROWN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.19	1.00
689	2/8/14 10:41	RMWT	1.1	mg/cm ²	Final	RIDGECAPCOVER	METAL	NORTH	INTACT	BROWN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.42	1.0
690	2/8/14 10:41	RMWT	1.1	mg/cm ²	Final	DOORJAMS	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.3	2.00
691	2/8/14 10:41	RMWT	1.1	mg/cm ²	Final	DOOR HHHH	METAL	NORTH	INTACT	BROWN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.67	2.00
692	2/8/14 10:46	RMWT	3.05	mg/cm ²	Final	RAIL	METAL	NORTH	INTACT	SILVER	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	10	1	4.08	0.98	0.5	1.1	-0.00	0.00
693	2/8/14 10:49	RMWT	1.1	mg/cm ²	Final	DOWNSPOUT	METAL	WEST	INTACT	BROWN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.30	1.75
694	2/8/14 10:49	RMWT	1.1	mg/cm ²	Final	OUTLET	METAL	WEST	INTACT	BROWN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.06	1.07
695	2/8/14 10:50	RMWT	1.1	mg/cm ²	Final	CAR STOP	CONCRETE	WEST	INTACT	YELLOW	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-1.04	2.00
696	2/8/14 10:50	RMWT	1.1	mg/cm ²	Final	ELECTRICAL BOX	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.72	2.70
697	2/8/14 10:51	RMWT	1.1	mg/cm ²	Final	ELECTRICAL BOX DO	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.77	2.70
698	2/8/14 10:51	RMWT	1.1	mg/cm ²	Final	ELECTRICAL TRIM	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.8	2.70
699	2/8/14 10:51	RMWT	1.1	mg/cm ²	Final	BOX 2200	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.49	2.70
700	2/8/14 10:51	RMWT	1.1	mg/cm ²	Final	BOX 2200 DOOR	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.82	2.00
701	2/8/14 10:54	RMWT	1.1	mg/cm ²	Final	BOX 2068	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.48	2.00
702	2/8/14 10:54	RMWT	1.1	mg/cm ²	Final	BOX 2068 DOOR	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.65	2.00
703	2/8/14 10:57	RMWT	1.1	mg/cm ²	Final	ELECTRICAL BOX-4	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.8	2.70
704	2/8/14 10:57	RMWT	1.1	mg/cm ²	Final	ELECTRICAL BOX-2	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.03	2.00
705	2/8/14 10:57	RMWT	1.1	mg/cm ²	Final	ELECTRICAL BOX	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.8	2.70
706	2/8/14 10:58	RMWT	1.1	mg/cm ²	Final	ELECTRICAL BOX TR	METAL	WEST	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.67	2.5
707	2/8/14 10:58	RMWT	1.1	mg/cm ²	Final	HVAC	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.69	2.00
708	2/8/14 10:58	RMWT	1.1	mg/cm ²	Final	HVAC COVER	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.45	2.00
709	2/8/14 10:59	RMWT	0.20	mg/cm ²	Final	CONDUIT	METAL	WEST	INTACT	SILVER	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Null	1	1	0	0.02	0	0.02	0.4	5.0
710	2/8/14 10:59	RMWT	2.10	mg/cm ²	Final	CONDUIT	METAL	WEST	INTACT	SILVER	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	2.04	1	0.07	0.0	0.01	0.02	0.07	0.0
711	2/8/14 11:00	RMWT	1.1	mg/cm ²	Final	DOOR	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.06	2.70
712	2/8/14 11:00	RMWT	1.1	mg/cm ²	Final	DOOR TRIM	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-1.2	1.90
713	2/8/14 11:01	RMWT	1.1	mg/cm ²	Final	DOOR CASE	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.06	1.00
714	2/8/14 11:01	RMWT	1.1	mg/cm ²	Final	DOOR STOP	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.60	2.00
715	2/8/14 11:01	RMWT	0.11	mg/cm ²	Final	DOOR JAMB	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Null	1	1	0	0.02	0	0.02	-1.52	3.0
716	2/8/14 11:01	RMWT	1.1	mg/cm ²	Final	DOOR JAMB	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.68	2.07
717	2/8/14 11:01	RMWT	1.1	mg/cm ²	Final	LIGHT	METAL	WEST	INTACT	BROWN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.69	1.70
718	2/8/14 11:01	RMWT	1.1	mg/cm ²	Final	WALLTRIM	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.61	2.00
719	2/8/14 11:01	RMWT	1.1	mg/cm ²	Final	WALL	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.36	1.50
720	2/8/14 11:04	RMWT	1.1	mg/cm ²	Final	WALL BASE	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	OUTSIDE	Negative	1	1	0	0.02	0	0.02	-0.24	1.07
721	2/8/14 11:04	RMWT	1.1	mg/cm ²	Final	WALL	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.22	1.7
722	2/8/14 11:05	RMWT	1.1	mg/cm ²	Final	WALL TRIM	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.3	1.00
723	2/8/14 11:05	RMWT	1.1	mg/cm ²	Final	DOOR	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.66	2.07
724	2/8/14 11:05	RMWT	1.1	mg/cm ²	Final	DOOR CASE	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-1.14	2.0
725	2/8/14 11:06	RMWT	1.1	mg/cm ²	Final	I BEAM	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-1.17	2.40
726	2/8/14 11:07	RMWT	1.1	mg/cm ²	Final	EDGE SQAM	METAL	WEST	INTACT	GAUV	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.85	2.00
727	2/8/14 11:07	RMWT	1.1	mg/cm ²	Final	ROOF SPPY	METAL	WEST	INTACT	GAUV	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.25	2.00
728	2/8/14 11:09	RMWT	1.1	mg/cm ²	Final	ROOF	METAL	WEST	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0.01	0.02	0.01	0.02	-0.27	1.00
729	2/8/14 11:10	RMWT	1.97	mg/cm ²	Final	CONDUIT	METAL	WEST	INTACT	GAUV	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.5	1.00
730	2/8/14 11:11	RMWT	1.1	mg/cm ²	Final	WALL	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.13	1.00
731	2/8/14 11:11	RMWT	1.1	mg/cm ²	Final	DOOR	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.56	2.00
732	2/8/14 11:11	RMWT	1.1	mg/cm ²	Final	DOOR TRIM	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.34	1.00
733	2/8/14 11:11	RMWT	1.1	mg/cm ²	Final	DOOR CASE	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.3	2.00
734	2/8/14 11:12	RMWT	1.1	mg/cm ²	Final	WALLTRIM	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.14	1.00
735	2/8/14 11:12	RMWT	1.1	mg/cm ²	Final	I BEAM	METAL	NORTH	INTACT	TAN	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.01	2.07
736	2/8/14 11:13	RMWT	1.1	mg/cm ²	Final	SWITCH BOX	METAL	NORTH	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02	-0.29	2.00
737	2/8/14 11:13	RMWT	1.1	mg/cm ²	Final	SWITCH BOX DOOR	METAL	NORTH	INTACT	GRAY	4050 RIVER HOLLOW	DOC	FRST	INSIDE	Negative	1	1	0	0.02	0	0.02		

APPENDIX V

Performance Characteristic Sheet

Performance Characteristic Sheet

EFFECTIVE DATE: September 24, 2004

EDITION NO.: 1

MANUFACTURER AND MODEL:

Make: Niton LLC

Tested Model: XLP 300

Source: ^{109}Cd

Note: This PCS is also applicable to the equivalent model variations indicated below, for the Lead-in-Paint K+L variable reading time mode, in the XLI and XLP series:

XLI 300A, XLI 301A, XLI 302A and XLI 303A.

XLP 300A, XLP 301A, XLP 302A and XLP 303A.

XLI 700A, XLI 701A, XLI 702A and XLI 703A.

XLP 700A, XLP 701A, XLP 702A, and XLP 703A.

Note: The XLI and XLP versions refer to the shape of the handle part of the instrument. The differences in the model numbers reflect other modes available, in addition to Lead-in-Paint modes. The manufacturer states that specifications for these instruments are identical for the source, detector, and detector electronics relative to the Lead-in-Paint mode.

FIELD OPERATION GUIDANCE

OPERATING PARAMETERS:

Lead-in-Paint K+L variable reading time mode.

XRF CALIBRATION CHECK LIMITS:

0.8 to 1.2 mg/cm² (inclusive)

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 readings are outside the acceptable calibration check range, follow the manufacturer's instructions to bring the instruments into control before XRF testing proceeds.

SUBSTRATE CORRECTION:

For XRF results using Lead-in-Paint K+L variable reading time mode, substrate correction is not needed for:

Brick, Concrete, Drywall, Metal, Plaster, and Wood

INCONCLUSIVE RANGE OR THRESHOLD:

K+L 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

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 from the EPA/HUD evaluation using archived building components. Testing was conducted in August 2004 on 133 testing combinations. The instruments that were used to perform the testing had new sources; one instrument's was installed in November 2003 with 40 mCi initial strength, and the other's was installed June 2004 with 40 mCi initial strength.

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.

SUBSTRATE CORRECTION VALUE COMPUTATION:

Substrate correction is not needed for brick, concrete, drywall, metal, plaster or wood when using Lead-in-Paint K+L variable reading time mode, the normal operating mode for these instruments. If substrate correction is desired, refer to Chapter 7 of the HUD Guidelines for guidance on correcting XRF results for substrate bias.

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. Use the K+L variable time mode readings.

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

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 housing a result is defined as the average of three readings. In multifamily housing, a result is 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 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 results.

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

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:

For the Lead-in-Paint K+L variable reading time mode, the instrument continues to read until it is moved away from the testing surface, terminated by the user, or the instrument software indicates the reading is complete. The following table provides testing time information for this testing mode. The times have been adjusted for source decay, normalized to the initial source strengths as noted above. Source strength and type of substrate will affect actual testing times. At the time of testing, the instruments had source strengths of 26.6 and 36.6 mCi.

Testing Times Using K+L Reading Mode (Seconds)						
Substrate	All Data			Median for laboratory-measured lead levels (mg/cm ²)		
	25 th Percentile	Median	75 th Percentile	Pb < 0.25	0.25 ≤ Pb < 1.0	1.0 ≤ Pb
Wood Drywall	4	11	19	11	15	11
Metal	4	12	18	9	12	14
Brick Concrete Plaster	8	16	22	15	18	16

CLASSIFICATION RESULTS:

XRF results are classified as positive if they are greater than or equal to the threshold, and negative if they are less than the threshold.

DOCUMENTATION:

A document titled *Methodology for XRF Performance Characteristic Sheets* 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. For a copy of this document call the National Lead Information Center Clearinghouse at 1-800-424-LEAD.

This XRF Performance Characteristic Sheet was developed by the Midwest Research Institute (MRI) and QuanTech, Inc., under a contract between MRI and the XRF manufacturer. HUD has determined that the information provided here is acceptable when used as guidance in conjunction with Chapter 7, Lead-Based Paint Inspection, of HUD's *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.