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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
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FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
BRISTOL ARMORY
BRISTOL, CONNECTICUT

February 2006
PN: 39741509

Non-Responsive	Non-Responsive
Office Manager	Project Manager

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FOIA Requested Record #J-15-0085 (CT)
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TABLE OF CONTENTS

Section **Page**

BEST AVAILABLE COPY

TABLE OF CONTENTS (Cont.)

APPENDICES

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

BEST AVAILABLE COPY

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lead		
Lead was detected in wipe samples collected from the administrative area and former firing range in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range and administrative area where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Peeling white lead-based paint was present in the kitchen.	Personnel trained in accordance with the OSHA Lead Standard should stabilize peeling lead paint (OSHA 29 CFR 1910.1025 (h)(1))	RAC 4
Peeling paint was observed in the drill hall, however the paint could not be sampled at the time of the survey due to the height of the damaged paint.	Paint should be sampled by qualified personnel if determined to be "lead-based" then personnel trained in accordance with the OSHA Lead Standard should stabilize peeling lead paint (OSHA 29 CFR 1910.1025 (h)(1))	RAC 4
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in many of the offices.	Increase lighting in the administrative areas. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Hazard Communication		
A site specific hazard communication plan was not available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4

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FINDINGS AND RECOMMENDATIONS (Cont)

Findings	Recommendation	Risk Assessment Code
Mold		
Water damage was observed throughout the third floor and drill hall. Mold growth could become an issue if left unattended.	Determine and repair source of water, Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office , URS Corporation (URS) conducted an industrial hygiene survey at the Bristol Armory located at 61 Center Street in Bristol, Connecticut 06010. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On August 25, 2005, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Bristol, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Mr. Non-Responsive site contact for this survey.

This armory is a three-story brick building, with an attached drill hall, that is constructed primarily of brick and mortar. This facility is built on a concrete slab, with hardwood floors on the upper levels and a pitched asphalt roof. The building was constructed in 1928. An armory layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 6 of 1092

BEST AVAILABLE COPY

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. If more than one person is using that station, then proper adjustments need to be made to accommodate each person.

Paints, thinners and other chemicals were located in the flammable storage lockers with hazard communication data.

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the drill hall, mess hall, boiler room, readiness room, classroom, drill floor and outside. These readings were all measured using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received by URS during this survey.

Water damage was observed throughout this area especially on the third floor from water leaks

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 40.3-41.7 % throughout the various building areas with an average of 41.4%. This average reading was below the recommended maximum of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 7 of 1092

BEST AVAILABLE COPY

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from a low of 440 to450 parts per million (ppm), with an average of 445 ppm. The outside reading was 400 ppm.

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 400 ppm on the day of the survey, the ASHRAE limit would be 1,100 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 4 to 5 ppm on the day of the survey. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments (62.1-2004). Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 8 of 1092

recommended lighting requirement (ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (lux / foot candles)	Recommended Lighting LUX
Drill Hall	Assembly	80 / 7	300 / 30
Supply Room	Supply	470 / 42	300 / 30
Room 12, Orderly Room	Administration	480 / 42	500 / 50
Band, Orderly Room	Administration	830 /73	500 /50

2.2.5 Lead

Wipe testing for lead was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 2-2 below shows the results of the lead sampling.

Table 2-2
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Hall Outside Mess Hall – Floor	0825-16	0.108	39	200
Cage Area Across From Mess Hall Floor – Floor	0825-17	0.108	110	200
North Corridor First Floor – Top of Flammable Cabinet	0825-18	0.108	530	200
Band Locker Room	0825-19	0.108	150	200
Infantry Orderly Room 2nd Floor Window Sill	0825-20	0.108	280	200
First Sergeant's Room - Window Ledge	0825-21	0.108	1200	200
Main Stairwell Back Ledge	0825-22	0.108	12	200
BLANK	0825-15	N/A	<2.8 µg	N/A

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 9 of 1092

Paint chips were collected in three areas where paint was peeling and sent to AMA for analysis. One of the three samples was found to contain lead in a concentration above the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-3 below shows the results of the lead paint testing.

Table 2-3
Levels of Lead in Paint in the Administrative Areas

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Kitchen – Concrete Wall Near Window	0825-23	0.01	0.52
2nd Floor Ladies Room – Under Window	0825-24	0.01	0.012
Room #19 - Wall	0825-26	0.01	0.072

The analytical report from AMA is contained in Appendix D.

2.2.6 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020 EPA-600/R-93-116). Table 2-4 below presents the results of the sample analysis.

Table 2-4
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Room 21 – Day Room	Paneling Mastic	0825-27A	NAD
Room 21 – Day Room	Paneling Mastic	0825-27B	NAD

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 10 of 1092

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Table 2-4 (Cont)
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Room 21 – Day Room	Paneling Mastic	0825-27C	NAD
Room 14	Brown Linoleum	0825-28A	NAD
Room 14	Brown Linoleum	0825-28B	NAD
Room 14	Brown Linoleum	0825-28C	NAD

NAD = "No Asbestos Detected"

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in approximately 50% of the offices and in numerous other areas throughout

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 11 of 1092

the facility. URS recommends increasing the area lighting or supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: Dust wipe samples collected the flammable cabinet, the window sill of the orderly room and the window ledge in the first sergeant's office were above the 200 micrograms/ square foot acceptable limit recommended by the NGB Region North Industrial Hygiene office (appendix G). These areas as well as the rest of the exterior window sills and ledges should be cleaned in accordance with the OSHA lead rule (29 CFR 1910.1025).

A paint chip collected from the kitchen area determined that the white painted concrete wall is coated with lead-based paint (LBP). Currently, there are no federal or state regulations that require removal of LBP prior to building demolition or renovation, however since this material is peeling the paint should be stabilized. Stabilization of lead-based paint should be conducted by workers trained in accordance with the OSHA lead standard (29 CFR 1910.1025 and 29 CFR 1926.62)

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 12 of 1092

BEST AVAILABLE COPY

3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now used for the mess hall.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead dust was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Mess Hall South, Floor	0825-10	10x10 cm	340	200
Mess Hall Center, Floor	0825-11	10x10 cm	640	200
Mess Hall North, Floor	0825-12	10x10 cm	220	200
Mess Hall northwest, Floor	0825-13	10x10 cm	270	200
Mess Hall Southwest, Floor	0825-14	10x10 cm	420	200
Blank	0804-04	N/A	0.31	200

Sample numbers and locations can be found on the site map in Appendix A.

Air samples for lead dust were collected from the Former Firing Range. Table 3-2 below shows the results of these air samples.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 13 of 1092

BEST AVAILABLE COPY

Table 3-2
Airborne Concentrations of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	Lead Action Level ($\mu g/m^3$)
Drill Hall, Stage Area	0825-01	300	<10	30.0
Mess Hall, Center	0825-02	160	<19	30.0
Blank	0825-03	N/A	<3	N/A

Sample numbers and locations can be found on the site map in appendix A.

On the day of the survey, the airborne lead dust levels in the Former Firing Range were found to be below the OSHA action level of 30.0 $\mu g/m^3$ averaged over an 8-hour day.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be above allowable limits and require cleaning and further testing. The NGB Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Appendix H contains guidelines for the cleanup and rehabilitation of former indoor firing ranges.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 14 of 1092

BEST AVAILABLE COPY

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a hard wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall Corner Near Lobby, Floor	0825-05	10x10 cm	17	200
Drill Hall Southwest Corner, Floor	0825-06	10x10 cm	35	200
Drill Hall Center, Floor	0825-07	10x10 cm	8.8	200
Drill Hall Northeast, Floor	0825-08	10x10 cm	50	200
Drill Hall Stage, Center	0825-09	10x10 cm	150	200
Blank	0825-04	N/A	0.31	200

Sample numbers and locations can be found on the site map in Appendix A.

A paint chip was collected in the drill hall where paint was peeling and sent to AMA for analysis. The sample was found to contain lead in a concentration within the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 15 of 1092

Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 4-2 below shows the results of the lead paint testing.

Table 4-2
Levels of Lead in Paint in the Drill Hall

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Stage Area	0825-25	0.01	<0.0076

The analytical report from AMA is contained in Appendix D. Peeling paint was observed on the upper portion of the drill hall wall and was inaccessible.

4.2.2 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020 EPA-600/R-93-116). Table 4-3 below presents the results of the sample analysis.

Table 4-3
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Stage Area of Drill Hall	Plaster (Skim Coat)	0825-29A	NAD
Stage Area of Drill Hall	Plaster (Skim Coat)	0825-29B	NAD
Stage Area of Drill Hall	Plaster (Skim Coat)	0825-29C	NAD

NAD = "No Asbestos Detected"

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 16 of 1092

The analytical report from AMA Analytical Services, Inc. is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be below allowable limits and require no cleaning or further testing. The NGB Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

Peeling paint was observed on the upper portion of the drill hall wall and was inaccessible. This paint should be considered "lead-based" until sampling can confirm of refute.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 17 of 1092

BEST AVAILABLE COPY

5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

5.2.1 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) in this area for a determination of asbestos content. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020 EPA-600/R-93-116). Table 5-1 below presents the results of the sample analysis.

Table 5-1
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Boiler	Refractory Cement	0825-30A	NAD
Boiler	Refractory Cement	0825-30B	NAD
Boiler	Refractory Cement	0825-30C	NAD
Boiler	Boiler Insulation	0825-31A	NAD
Boiler	Boiler Insulation	0825-31B	NAD
Boiler	Boiler Insulation	0825-31C	NAD

NAD = "No Asbestos Detected"

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA Analytical Services, Inc. is contained in Appendix D. Mr. Non-Responsive asbestos inspector training certificate is provided in Appendix E.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 18 of 1092

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

ASBESTOS: Asbestos-containing pipe insulation in the boiler room was observed to be in good condition

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 19 of 1092

BEST AVAILABLE COPY

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was found regarding hazard communication. Training records are maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 20 of 1092

BEST AVAILABLE COPY

7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15, 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

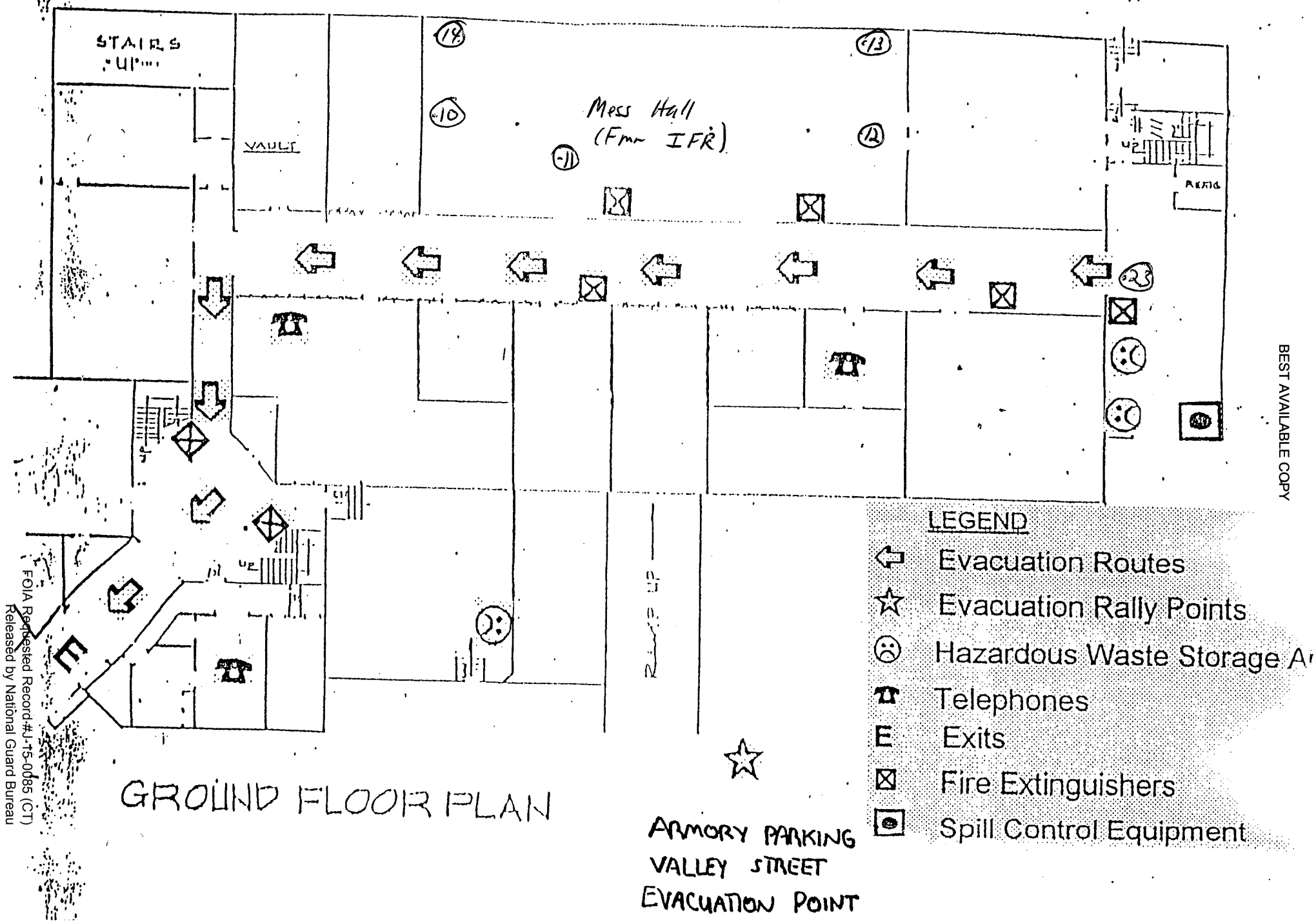
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 21 of 1092

BEST AVAILABLE COPY

APPENDIX A

ARMORY DRAWING

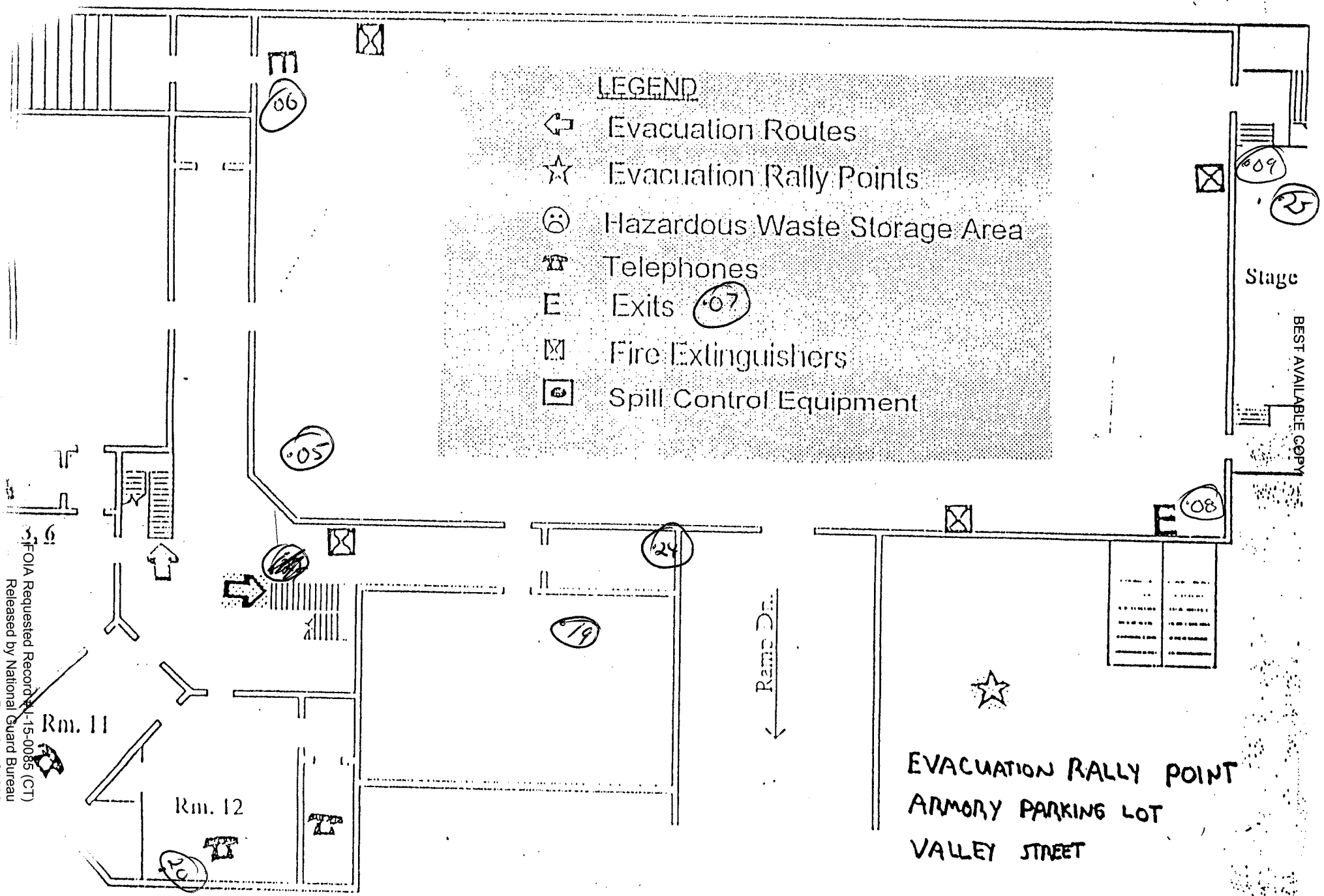
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau



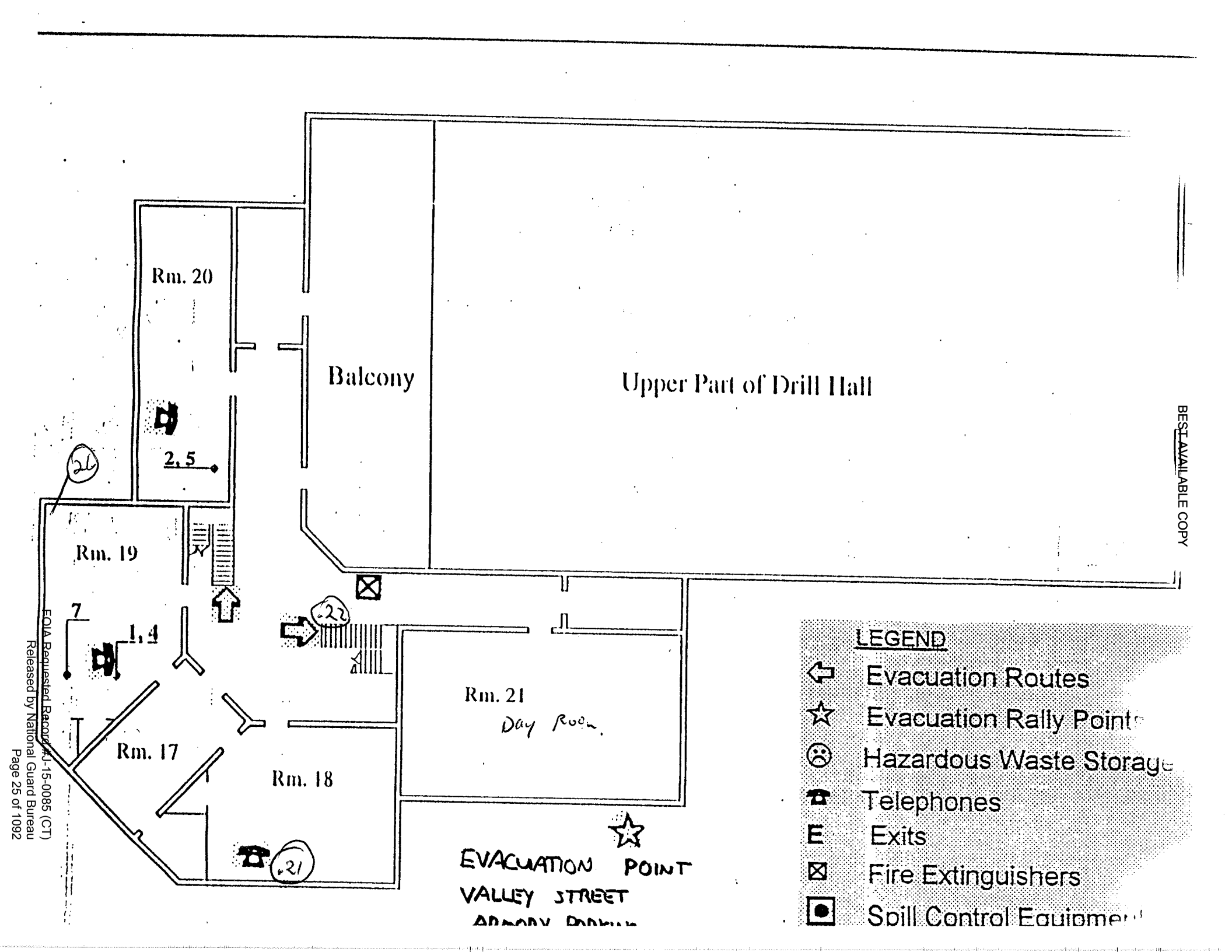
GROUND FLOOR PLAN

BEST AVAILABLE COPY

FOIA Requested Record#J-15-0085 (CT)
Released by National Guard Bureau
Page 23 of 1092



BEST AVAILABLE COPY
FOIA Requested Record 14-15-0085 (CT)
Released by National Guard Bureau
Page 24 of 1092



BEST AVAILABLE COPY

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 25 of 1092

BEST AVAILABLE COPY

APPENDIX B

PERSONNEL LIST

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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PERSONEL LIST
BRISTOL ARMORY

Name	Rank
Non-Responsive [redacted]	Not Provided
[redacted]	Not Provided
[redacted]	Not Provided
[redacted]	Not Provided
[redacted]	Not Provided

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APPENDIX C

HAZARDOUS MATERIALS LIST

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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SN	ITEM	SIZE	QUANTITY

AS of 26 MAR 04

CABINET # 1

SELF # 1			
NSN	ITEM	SIZE	QUANTITY
804000263848	TACC LIQUID TENT PATCHING ADHESIVE	½ PINT	6 CANS
	KINGSFORD CHARCOAL LIGHTER	1 QUART	2 QUARTS
801000958148	LBH INDUSTRIES SO SURE ORANGE SPRAY PAINT	10 OZ	6 CANS
8010002906984	LBH INDUSTRIES SO SURE GLOSS BLACK SPRAY PAINT	10.25 OZ	2 CANS
8010005843149	LBH INDUSTRIES SO SURE GLOSS OLIVE GREEN SPRAY PAINT	10 OZ	2 CANS
SELF # 2			
NSN	ITEM	SIZE	QUANTITY
9150011021473	ROYAL LUBRICANTS COMPANY/ ROYCO ® 634 CLEANER ,LUBRICANT AND PRESERVATIVE	.5 OZ	[redacted] BOTTLES 117
9150010796124	ROYAL LUBRICANTS COPANY/ ROYCO ® 634 CLEANER, LUBRICANT AND PRESERVATIVE	4 0Z	[redacted] BOTTLES 105
9150010536688	BREAK FREE	1 GALLON	¾ GALLON
9150010536688	BREAK FREE	1 QUART	¾ QUART

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NSN	ITEM	SIZE	QUANTITY

AS OF 26 MAR 04

CABINET # 2

SELF # 1			
NSN	ITEM	SIZE	QUANTITY
	TORO GAS STABILIZER	8 OZ	BOTTLES
	MINWAX WOODFINISH	½ PINT	1 CAN
	NEVER DULL	5 OZ	1 CAN
	FAMOWOOD WOOD PLASTIC	½ PINT	1 CAN
	ILSCO DE-OX OXIDE INHIBITOR	8 OZ	1 BOTTLE
	TRUE VALUE PVC CEMENT	4 OZ	1 CAN
	OATEY ABS CEMENT	4 OZ	1 CAN
	TRUBOND CONTACT CEMENT	1 QUART	1 CAN
	TRUE TEST X-O RUST	½ PINT	1 CAN
	TOLUENE CLEANING SOLVENT	1 PINT	3 CANS
	FREON TP 35 UNISYS	1 PINT	3 CANS
	PAINT THINNER	1 GALLON	1 CAN
	MOORE LIFE PAINT	½ PINT	1 CAN
	Break Free	1 GALLON	¼ GALLON
	Break Free	16 OZ	1 ½ OZ
	Break Free	4 OZ	6 OZ
	Break Free	.5 OZ	.15 OZ
SELF # 2			
NSN	ITEM	SIZE	QUANTITY
6910001487011	DECON TRAINING KIT	1 KIT	4 KITS
4230011013984	DECON M258A1	1 KIT	40 KITS
6910011011764	DECON M58A	1 KIT	28 KITS
	PICKUP RUG CLEANER	1 GALLON	1 BOTTLE
	SWELL STAINLESS STEEL CLEANER	1 GALLON	1 BOTTLE
	EMPTY GAS CAN	5 GALLON	EMPTY

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APPENDIX D

ANALYTICAL RESULTS

FOIA Requested Record #J-15-0085 (CT)
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09/30/2005 14:31 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.707 001

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Bristol Armory	**Chain Of Custody:**	144187
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Administaivration Drills	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	9/30/2005

Report Date: 30-Sep-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0568447	0525-04	Furnace	Wipe Blank	****	N/A	0.30	ug	0.31	ug	
0568448	0525-05	Furnace	Wipe	****	0.108	2.79	ug/ft²	17	ug/ft²	
0568449	0525-06	Furnace	Wipe	****	0.108	6.97	ug/ft²	35	ug/ft²	
0568450	0525-07	Furnace	Wipe	****	0.108	2.79	ug/ft²	8.8	ug/ft²	
0568451	0525-08	Furnace	Wipe	****	0.108	6.97	ug/ft²	50	ug/ft²	
0568452	0525-09	Furnace	Wipe	****	0.108	69.70	ug/ft²	150	ug/ft²	
0568453	0525-10	Furnace	Wipe	****	0.108	69.70	ug/ft²	340	ug/ft²	
0568454	0525-11	Furnace	Wipe	****	0.108	69.70	ug/ft²	640	ug/ft²	
0568455	0525-12	Furnace	Wipe	****	0.108	69.70	ug/ft²	220	ug/ft²	
0568456	0525-13	Furnace	Wipe	****	0.108	69.70	ug/ft²	270	ug/ft²	
0568457	0525-14	Furnace	Wipe	****	0.108	69.70	ug/ft²	420	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted]

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FOIA Requested Record #J-15-0085 (CT)
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09/30/2005 14:31 Page 32 of 39

09/28/2005 10:37 AEROSOL MONITORING & ANALYSIS → 16038936240 ND.633 P06
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Page 33 of 1092

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Bristol Armory Center St. Bristol CT	**Chain Of Custody:**	144195
Address:	301-H Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	3974150100401	**Date Analyzed:**	9/28/2005
Attention:	[redacted]			**Report Date:**	28-Sep-05

Summary of Atomic Absorption Analysis for Lead

Page 1 of 1

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0568359	082501	Flame	Air	300	N/A	10.00	ug/m³	<	10	ug/m³	
0568360	082502	Flame	Air	160	N/A	18.75	ug/m³	<	19	ug/m³	
0568361	082503	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted]

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NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Bristol Armory	**Chain Of Custody:**	145342
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Offices/Assem	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	10/26/2005 **Report Date:** 26-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0604299	0825-15	Furnace	Wipe	****	0.108	2.79	ug/ft²	< 2.8	ug/ft²	
0604300	0825-16	Furnace	Wipe	****	0.108	13.94	ug/ft²	39	ug/ft²	
0604301	0825-17	Furnace	Wipe	****	0.108	69.70	ug/ft²	110	ug/ft²	
0604302	0825-18	Furnace	Wipe	****	0.108	69.70	ug/ft²	530	ug/ft²	
0604303	0825-19	Furnace	Wipe	****	0.108	69.70	ug/ft²	150	ug/ft²	
0604304	0825-20	Furnace	Wipe	****	0.108	69.70	ug/ft²	280	ug/ft²	
0604305	0825-21	Furnace	Wipe	****	0.108	139.41	ug/ft²	1200	ug/ft²	
0604306	0825-22	Furnace	Wipe	****	0.108	2.79	ug/ft²	12	ug/ft²	
0604307	0825-23	Flame	Paint Chip	****	N/A	0.01	%Pb	0.52	%Pb	
0604308	0825-24	Flame	Paint Chip	****	N/A	0.01	%Pb	0.012	%Pb	
0604309	0825-25	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.0076	%Pb	
0604310	0825-26	Flame	Paint Chip	****	N/A	0.01	%Pb	0.072	%Pb	

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NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Bristol Armory	**Chain Of Custody:**	145342		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Offices/Assem	**Date Submitted:**	10/21/2005		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	Not Provided	**Date Analyzed:**	10/26/2005	**Report Date:**	26-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)
%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.
Air and Wipe results are not corrected for any blank results

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst [redacted] **Technical Manager:** [redacted]

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10/04/2005 08:36 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.758 001

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NVLAP 101143-0 · NY ELAP 10920 · AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	144191
Address:	301-JH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Bristol Armory-CT	**Date Analyzed:**	10/4/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	39741509.0041		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments
0568549	0825 27A	NAD	–	–	–	–	–	–	TR	–	–	100	Yellow	Homogeneous	PC	
0568550	0825 27B	NAD	–	–	–	–	–	–	TR	–	–	100	Yellow	Homogeneous	PC	
0568551	0825 27C	NAD	–	–	–	–	–	–	–	–	–	100	Yellow	Homogeneous	PC	
0568552	0825 28A	NAD	–	–	–	–	–	–	10	–	–	90	Brown	Homogeneous	PC	
0568553	0825 28B	NAD	–	–	–	–	–	–	10	–	–	90	Brown	Homogeneous	PC	
0568554	0825 29A	NAD	–	–	–	–	–	–	TR	–	–	100	White	Homogeneous	PC	
0568555	0825 29B	NAD	–	–	–	–	–	–	TR	–	–	100	White	Homogeneous	PC	
0568556	0825 29C	NAD	–	–	–	–	–	–	TR	–	–	100	White	Homogeneous	PC	
0568557	0825 30A	NAD	–	–	–	–	15	–	5	–	–	80	Gray	Homogeneous	PC	
0568558	0825 30B	NAD	–	–	–	–	15	–	10	–	–	75	Gray	Homogeneous	PC	
0568559	0825 30C	NAD	–	–	–	–	20	–	5	–	–	75	Gray	Homogeneous	PC	
0568560	0825 31A	NAD	–	–	–	–	TR	TR	TR	–	TR	100	Lt. Blue	Homogeneous	PC	
0568561	0825 31B	NAD	–	–	–	–	TR	TR	–	–	TR	100	Lt. Blue	Homogeneous	PC	
0568562	0825 31C	NAD	–	–	–	–	TR	TR	TR	–	TR	100	Lt. Blue	Homogeneous	PC	

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Page 37 of 68

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NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	144191
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Bristol Armory-CT	**Date Analyzed:**	10/4/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	39741509.0941		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

[redacted]

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APPENDIX E

TRAINING CERTIFICATES

FOIA Requested Record #J-15-0085 (CT)
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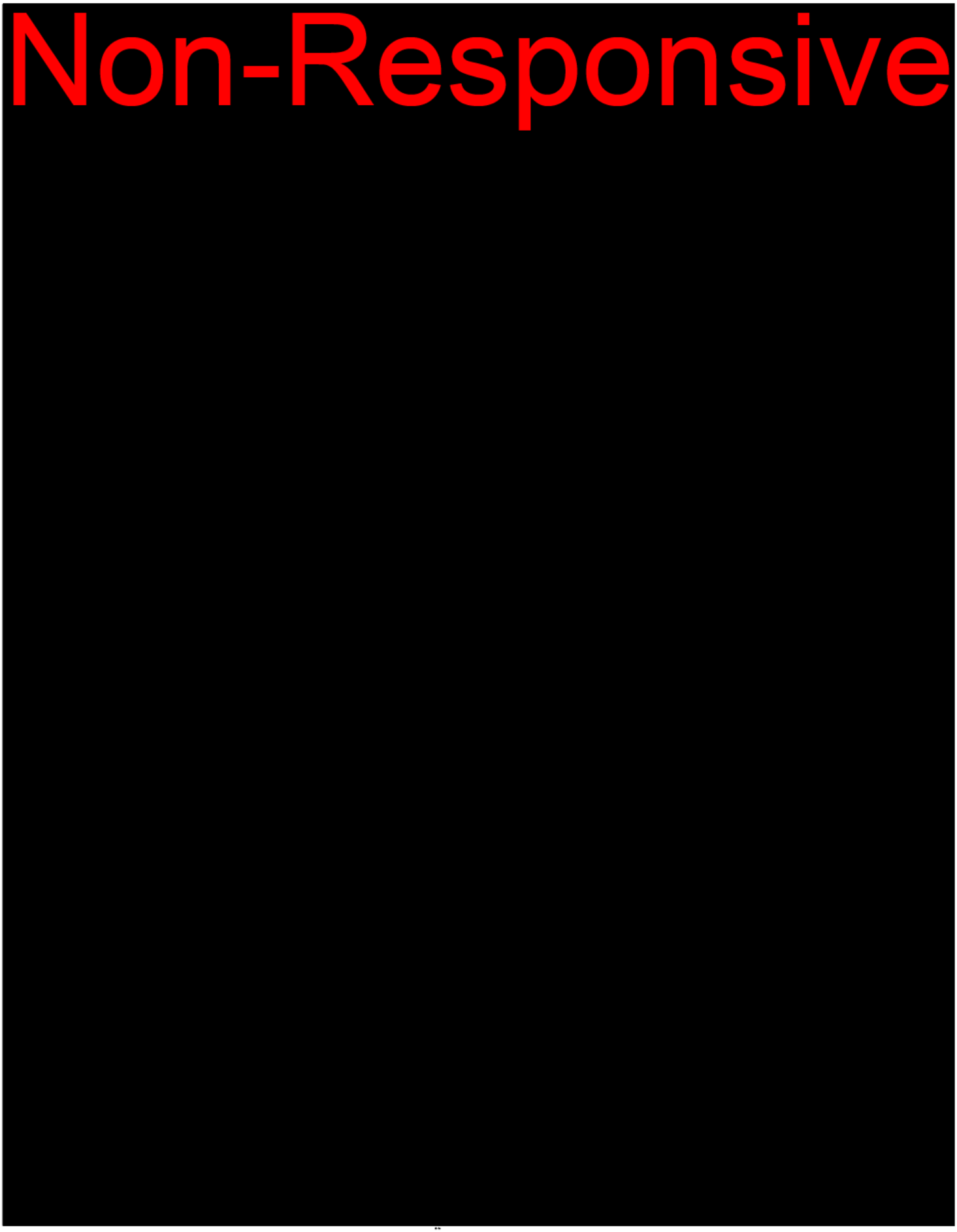

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T-877 P 04/06 F-281

Certificate of Training

[redacted] Non-Responsive

For successful completion of an 8 Hour, 1 Day

Asbestos Inspector & Management Planner

Annual Refresher Training

MARCH 25, 2003

This training was approved and given in accordance with Regulations for Connecticut State Agencies RCSA 20-440 - 1-9 and RCSA 20-441 and meets the requirements of the EPA Revised MAP under TSCA Title II of 4/4/94

Presented by

Mystic Air Quality Consultants, Inc.

1204 North Road, Groton, CT 06340 (800) 247-7746

Certificate Number: IMPR10543 **Exam Grade: 100%** **Exam Date: 03/25/2003** **Expiration Date: 03/25/2004**

[redacted] Non-Responsive

H, CSP, RS

[redacted] Non-Responsive

Training Director

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Page 1 of 1

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Apr-27-06 10:10 Page 01/02

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APPENDIX F

PHOTOGRAPHS

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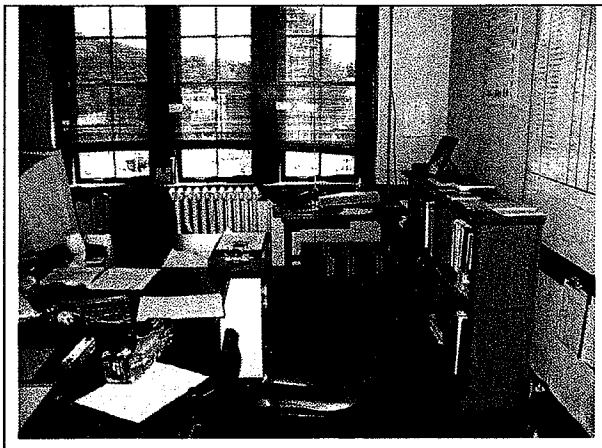

Photo 6874: 1st Sergeant's Office – Wipe sample (0825-21) from window sill

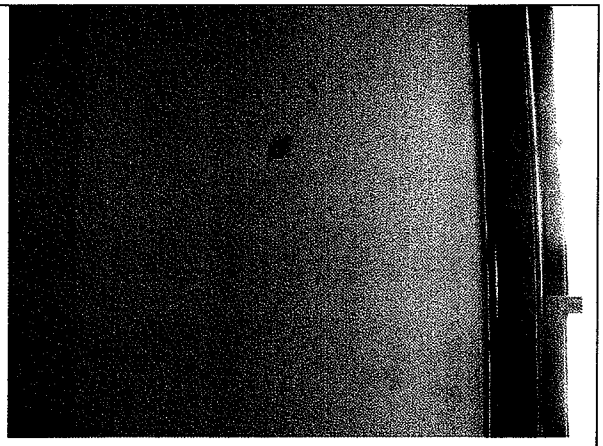

Photo 6875: Room #19 – Peeling paint from wall (paint Chip sample 0825-26)

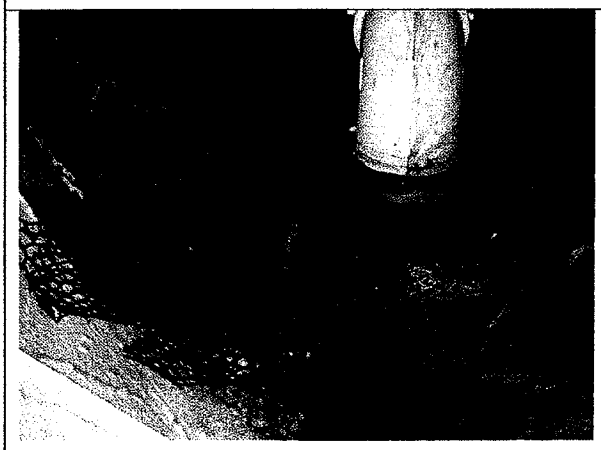

Photo 6876: Room #19 – Water damage to plaster ceiling

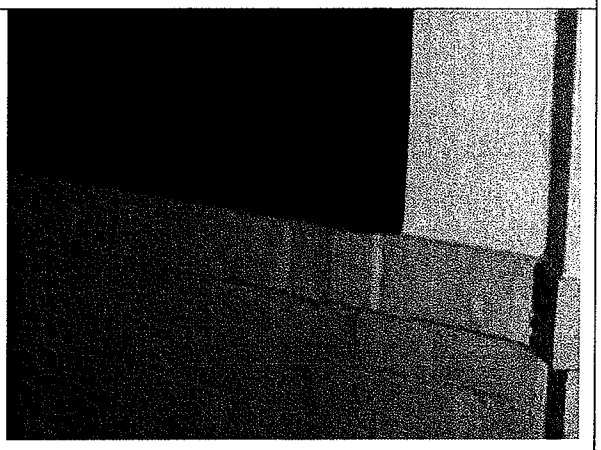

Photo 6877: Third Floor Stairwell – Wipe sample (0825-22).

Photo 6878: Drill Hall

Photo 6879: Infantry Orderly Office: Wipe sample (0825-20).

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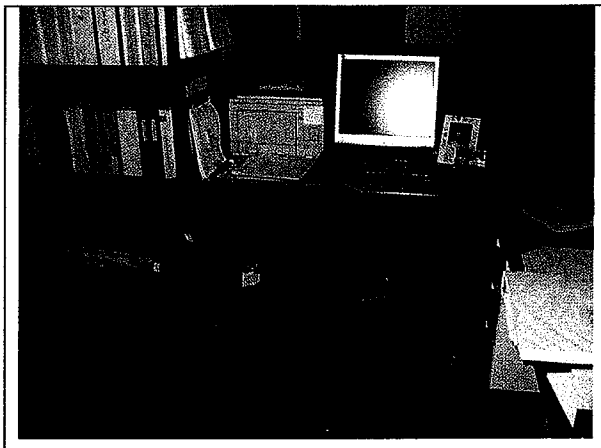

Photo 6880: Infantry Orderly Office – Computer work station.

Photo 6882: Drill Hall – Peeling paint (inaccessible)

Photo 6883: Drill Hall – Stage with water damaged plaster and peeling paint (0825-25).

Photo 6884: Boiler Room – Damaged boiler insulation (non-ACM)

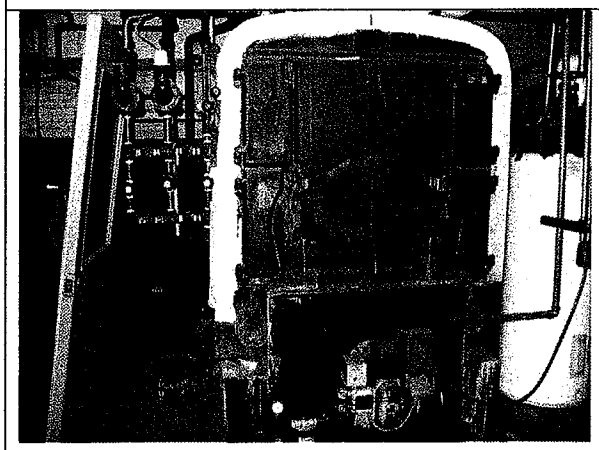

Photo 6885: Boiler Room

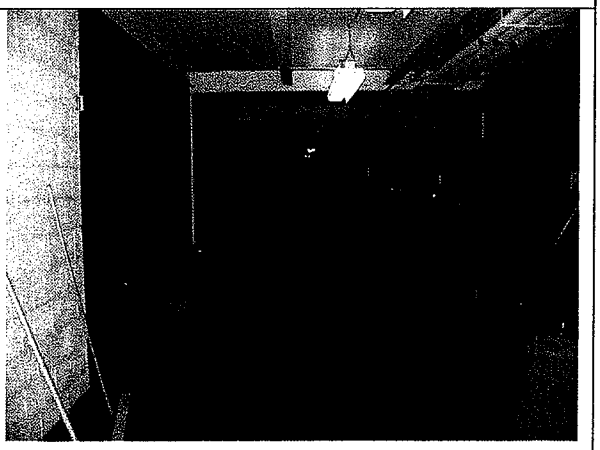

Photo 6886: First Floor Corridor – Typical

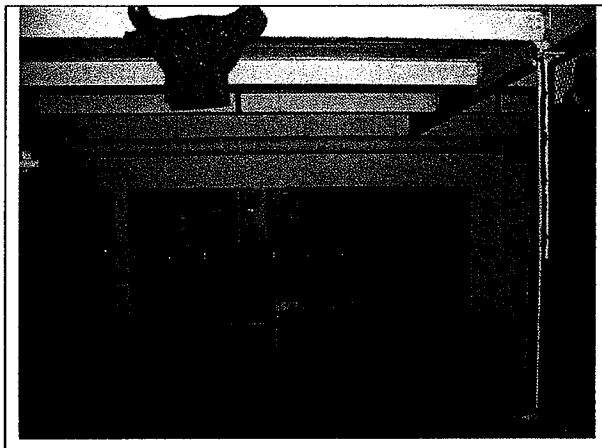

Photo 6887: Cage Area – wipe Sample (0825-17).

Photo 6888: Mess Hall – Former indoor firing range (Samples 0825-10, 11,12,13,&14)

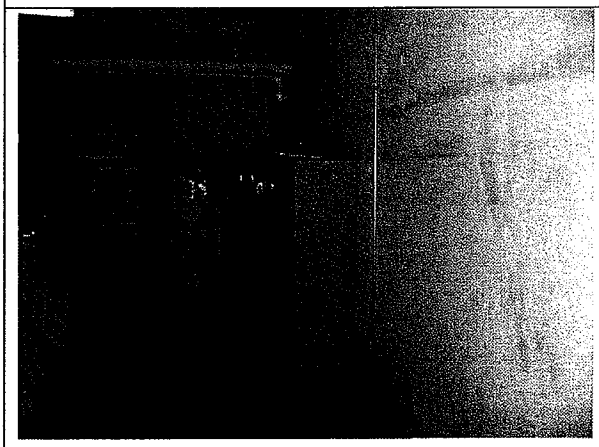

Photo 6889: 1st Floor Garage – Flammable locker

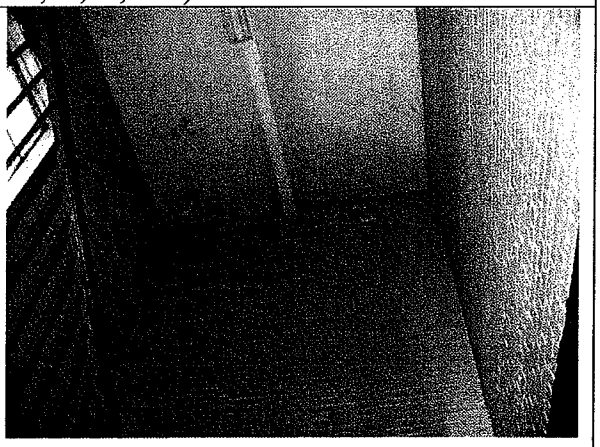

Photo 6890: Northwest Stair – Water damage.

Photo 6891: Exterior

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

FOIA Requested Record #J-15-0085 (CT)
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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15, 30 DECEMBER 2002)

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 49 of 1092

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3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman ™ #40 paper

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 50 of 1092

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 51 of 1092

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b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 52 of 1092

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 53 of 1092

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b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 54 of 1092

BEST AVAILABLE COPY

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 55 of 1092

BEST AVAILABLE COPY

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 56 of 1092

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 57 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 58 of 1092

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address		**Point of Contact** *(name & phone #)*	
		Samples Collected By	
Sampled Facility	**City**	**State**	**Location** *(bldg/area)*
Description of Operation		**Date Collected**	**Date Shipped**
Analysis Desired			
Sampling Data			

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 59 of 1092

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		**Point of Contact** *(name/phone #)*	
		Samples Collected By	
Sampled Facility	**City**	**State**	**Location** *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	**Method of Collection**
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								***B***
Time On								***L***
Time Off								***A***
Total Time (min)								***N***
Flow Rate (LPM)								***K***
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	**Calibration Date**	**Pump Manufacturer**
Comments to Lab:		

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 60 of 1092

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APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 61 of 1092

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APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 62 of 1092

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
ENFIELD ARMORY
ENFIELD, CONNECTICUT

September 2006
PN: 39741509

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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TABLE OF CONTENTS

Section **Page**

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TABLE OF CONTENTS (Cont)

APPENDICES

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in several of the offices.	Increase lighting in the administrative areas this may be accomplished through use of task lighting. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Asbestos		
A site-specific asbestos operations and maintenance plan was not available.	Develop and maintain a site specific asbestos operations and maintenance plan to manage asbestos-containing materials by labeling of asbestos (OSHA 29 CFR 1910.1001 (j)(4)); employee information and training (OSHA 29 CFR 1910.1001 (j)(7)); housekeeping (OSHA 29 CFR 1910.1001 (k)); medical surveillance (OSHA 29 CFR 1910.1001 (l)(1)); record keeping (OSHA 29 CFR 1910.1001 (m)(1))	RAC 3

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Enfield Armory located at 1635 King Street in Enfield, Connecticut 06082. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On September 7, 2005, Mr Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Enfield, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Mr. Non-Responsive site contact for this survey.

This armory is a single-story brick and block building, with an attached drill hall that is constructed primarily of brick and mortar. This facility is built on a concrete slab with a pitched roof. Interior finishes include floor tile, suspended ceilings and drywall. The building was constructed in 1964. A layout drawing of the facility is attached in Appendix A.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 68 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning workstations at the time of this survey.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the lobby/conference room, NCO operations, drill hall, orderly room, fitness center, and outside. These readings were all measured using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 48% - 54% throughout the various building areas with an average of 50%. The average reading was below the recommended maximum level of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from 547 to 732 parts per million (ppm), with an average of 640 ppm. The outside reading was 503 ppm.

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 69 of 1092

people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 503 ppm on the day of the survey, the ASHRAE limit would be 1,203 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations were measured throughout at 1 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 70 of 1092

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Foot Candles	Recommended Lighting Foot Candles
Lobby/Conference Room	Administrative Area	49	50
NCO Operations	Administrative Area	58	50
Recruiters	Administrative Area	45	50
Orderly Room	Administrative Area	47	50
BN Commander	Administrative Area	134	50
Supply Vault-Front	Indoor Stockroom-Active	16	5
Supply Vault-Back	Indoor Stockroom-Active	48	5

On the day of the survey, lighting in several of the offices was inadequate.

2.2.5 Asbestos

Damaged asbestos-containing materials (ACM) were observed in the facility. Broken 9"x9" floor tiles were observed in the kitchen and one damaged pipe fitting was observed in the fitness center. According to Lt. Non-Responsive, an ACM inspection was conducted prior to URS' survey, which confirms these materials to be ACM.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

ERGONOMICS: The ergonomic issues regarding the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in the lobby/conference room, recruiter's office, and orderly room. Personnel should supplement ambient light with task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 72 of 1092

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3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Firing End North-Floor	0907-10	0.111	43	200
Firing End South-Locker Top	0907-11	0.111	28	200
Floor Center	0907-12	0.111	36	200
Impact End-Floor	0907-13	0.111	60	200
Impact End-Locker Top	0907-14	0.111	53	200

Sample numbers and locations can be found on the site map in Appendix A. One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 73 of 1092

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Table 3-2
Airborne Concentration of Lead Dust

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Lead Permissible Exposure Limit ($\mu g/m^3$)
Indoor Firing Range-Center	0907-02	280	<11	50

Sample numbers and locations can be found on the site map in appendix A.

On the day of the survey, the lead dust level in the former indoor firing range was found to be below the OSHA permissible exposure limit of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be below allowable limits and require no cleaning or further testing. The NGB Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

The airborne lead dust level in the former indoor firing range was also found to be below the OSHA permissible exposure limit of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 74 of 1092

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4.0 DRILL HALL

4.1 Operation Description

The drill hall is an 8,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a hard wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Outside Female Latrine-Floor	0916-05	0.111	9.9	200
Outside Recruiting	0916-06	0.111	9.9	200
Outside Firing Range	0916-07	0.111	7.2	200
Outside Exit Door	0916-08	0.111	41	200
Outside Vault	0916-09	0.111	13	200

Sample numbers and locations can be found on the site map in Appendix A.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 75 of 1092

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be below allowable limits and require no cleaning or further testing. The NGB Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 76 of 1092

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5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

No chemical or physical agents were sampled in this area.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

No environmental, health or safety issues were observed in the boiler room.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 77 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was found regarding hazard communication. Training records are maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 78 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15, 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 79 of 1092

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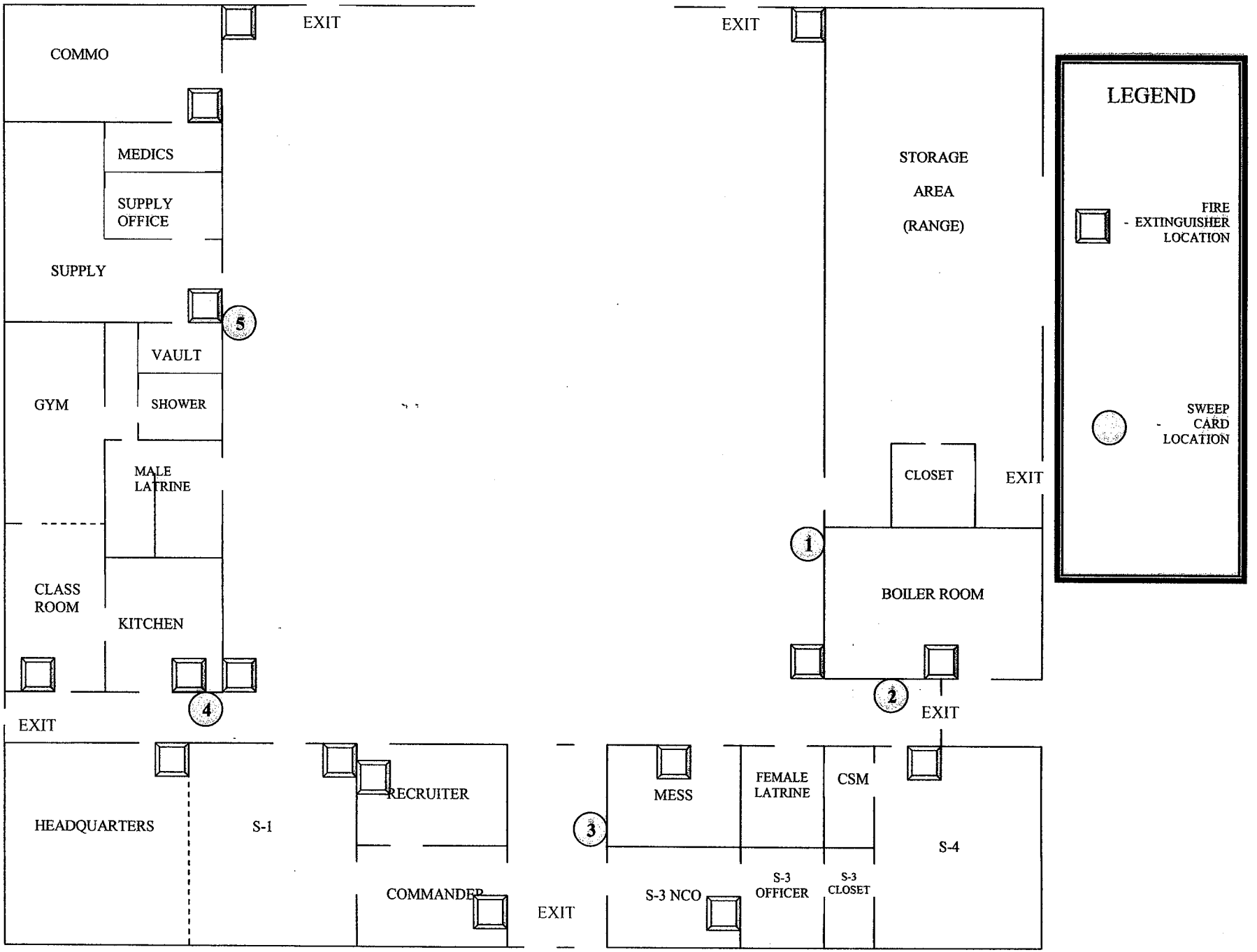
APPENDIX A

ARMORY DRAWING

ENFIELD ARMORY – EMERGENCY / FIRE EVACUATION PLAN



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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 81 of 1092

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APPENDIX B

PERSONNEL LIST

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

HHC 1/169TH AVN REGT

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1655 KING STREET

ENFIELD ARMORY

Class: Full Time Staff

INSTR:_____

DATE:___07 SEP 05____

	A	B	C	D	E	F	G
1	LAST	FIRST	MI	RNK	LAST 4	SIGNATURE	REMARKS PG 1
2	[redacted]						
3						Augmentee	
4							
5							
6						Augmentee	
7							
8						Augmentee	
9							
10						Flight School	
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							

Non-Responsive

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APPENDIX C

HAZARDOUS MATERIALS LIST

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MSDS

MSDS

CABINET #1

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MSDS INVENTORY REPORTS

* YELLOW CABINET

ITEM NAME	MSDS	STOCK	QUANTITY	MANUFACTURER	SHELF
Paint Latex Blue	1H21G	1H21G	4 gal.	Devoe Wonder Speed	1
" " Bedford Green	1V29B	1V29B	1 gal.	Devoe Wonder Speed	1
" " Bone White	307	307	20 gal.	Pittsburgh Speed Hide	1
" " Ceiling White	309	309	1 gal.	Pittsburgh	1
" " Harbor Blue	1D21C	1D21C	2 gal.	Devoe - Speed	1
Paint Exterior NAVAL Red	2923-01	2923-01	8 gal.	Devoe Accent Enamel	1
Paint Int/Ext oil BASE Gray	312	312	5 gal.	ICI ultra hide	1
Acrylic Traffic White	66-101	66-101	1 gal.	Coronado Superkote	1
					ONE SHELF only.
* Spray can * Stainless Steel Cleaner			1 CAN	CRACKIT, Twinkle	

* Flamable

MSDS

MSDS INVENTORY SHEET

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 58 of

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Hazardous Materials Storage Inventory Form

Facility Name ENFIELD ARMORY

Storage Location AUTO Locker

SLN (1)	FSC (2)	NIIN (3)	Product Name (4)	Manufacturer (5)	U/I (6)	Unit of Measure (7)	QTY (8)	In Date (9)	Shelflife Period (10)	MSDS # (11)	HCC (12)	Comments
TOP	6850	01-187-0052	BRAKE CLEAN	AMP	CN	OZ	7	01/03	24 MOS			
TOP	9150	01-108-7473	CLP	ROYAL LUBRICANTS	BOX	OZ	1	11/05	36 MOS			
TOP	9150	01-079-6249	CLP	ROYCO	BTL	OZ	17	7/05	36 MOS			
TOP	9150	01-054-6153	CLP	ROYCO	BTL	PT	7	11/05	36 MOS			
TOP	8030	01-478-9005	Corrosion Preve	WD-40	CN	OZ	4	1/09	60 MOS			
BTM	9150	01-053-6688	CL P	CSD Inc	BTL	GL	2	3/06	36 MOS			
BTM	8030	01-350-4184	Sealing Compound	ADAM'S Dyn	GN	GL	5	1/05	3 MOS			
BTM	6840	01-284-3982	Insect Repellent	3M CO	BX	OZ	5	11/02	60 MOS			
BTM	6840	01-345-0031	Insect Repellent	3M Co	BX	OZ	7	3/06	60 MOS			

(1) Shelf Location Number
(2) First Four Numbers of NSN
(3) Remaining number of NSN
(4) Product Name
(5) Manufacturer Name
(6) Unit of Issue- BT - Bottle, DM - Drum, CN - Can, BX - Box
(7) Unit of Measure- OZ, QT, GAL, PT
(8) Quantity Present at time of Inventory
(9) Shelflife - Product Good Until Date
(10) Shelflife Period in Months
(11) Material Safety Data Sheet Identification Number
(12) Hazardous Chemicals Code

Non-Responsive

Date of Inventory 12/13/06

Signature

Page ___ of ___

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FOIA Requested Record #J-15-0085 (C)
Released by National Guard Bureau
Page 86 of 1092

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APPENDIX D

ANALYTICAL RESULTS

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 87 of 1092

10/04/2005 11:08 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.774 003

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Enfield Armory	**Chain Of Custody:**	144189
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Armory-Drills Admin/Assembly	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	9/30/2005

Report Date: 04-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0568527	0907 04	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0568528	0907 05	Furnace	Wipe	****	0.111	2.70	ug/ft²	9.9	ug/ft²	
0568529	0907 06	Furnace	Wipe	****	0.111	2.70	ug/ft²	9.9	ug/ft²	
0568530	0907 07	Furnace	Wipe	****	0.111	2.70	ug/ft²	7.2	ug/ft²	
0568531	0907 08	Furnace	Wipe	****	0.111	13.50	ug/ft²	41	ug/ft²	
0568532	0907 09	Furnace	Wipe	****	0.111	2.70	ug/ft²	13	ug/ft²	
0568533	0907 10	Furnace	Wipe	****	0.111	13.50	ug/ft²	43	ug/ft²	
0568534	0907 11	Furnace	Wipe	****	0.111	13.50	ug/ft²	28	ug/ft²	
0568535	0907 12	Furnace	Wipe	****	0.111	13.50	ug/ft²	36	ug/ft²	
0568536	0907 13	Furnace	Wipe	****	0.111	13.50	ug/ft²	60	ug/ft²	
0568537	0907 14	Furnace	Wipe	****	0.111	13.50	ug/ft²	53	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] **Technical Manager:** [redacted]

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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Page 88 of 1022

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A Specialized Environmental Laboratory

NVLAP 101143-0 NY ELAP 10920 AIHA 100470

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	144202
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Enfield Armory Enfield CT	**Date Analyzed:**	9/30/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted] Non-Responsive
		P.O. Number:	39741509.0401		

Attention: [redacted] Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments
0568321	0907 22A	2	2	–	–	–	–	–	–	–	–	98	Green	Homogeneous	CK	
0568322	0907 22B	2	2	–	–	–	–	–	–	–	–	98	Green	Homogeneous	CK	
0568323	0907 22C	2	2	–	–	–	–	–	–	–	–	98	Green	Homogeneous	CK	
0568324	0907 23A	TR [1]	TR	–	–	–	–	–	2	–	–	98	Black	Homogeneous	CK	
0568325	0907 23B	5	5	–	–	–	–	–	–	–	–	95	Black	Homogeneous	CK	
0568326	0907 23C	2	2	–	–	–	–	–	TR	–	–	98	Black	Homogeneous	CK	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

[redacted] Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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Page 89 of 1092

09/28/2005 09:37 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.633 005
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AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	144192
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	1635 King St. Enfield , CT 06082	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	9/28/2005 **Report Date:** 28-Sep-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0568356	090701	Flame	Air	175	N/A	17.14	ug/m³	<	17 ug/m³	
0568357	090702	Flame	Air	280	N/A	10.71	ug/m³	<	11 ug/m³	
0568358	090703	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3 ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted]

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APPENDIX E

TRAINING CERTIFICATES

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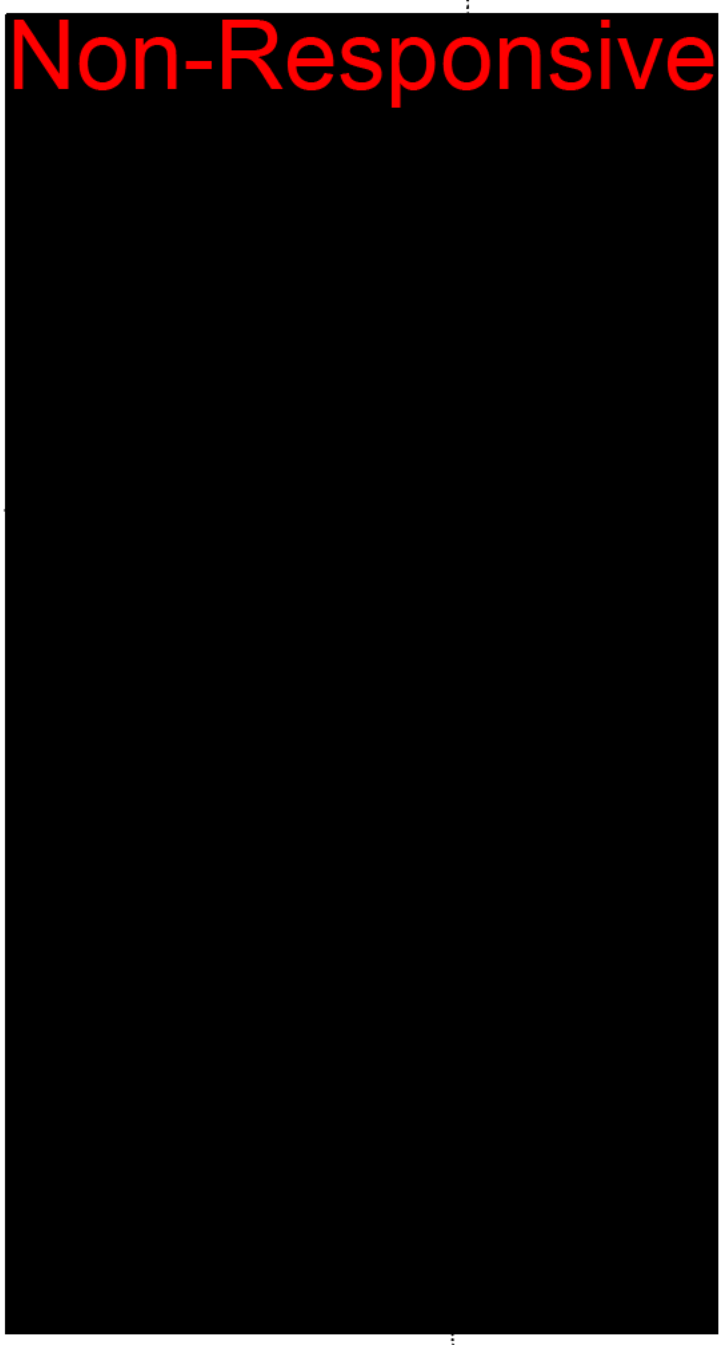

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May-04-05 09:34am From-URS CORPORATION T-867 P.03/05 F-090

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted] Non-Responsive

has completed the requisite training, and has passed an examination for reaccreditation

Asbestos Project Monitor Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

For course participants seeking New York State certification or New York State training reciprocity, the official record of successful completion is the DOH 2832 Certificate of Completion of Asbestos Safety Training

February 16, 2005
Course Dates

February 16, 2005
Examination Date

05739517413670
Certificate Number

February 16, 2006
Expiration Date

[redacted] Non-Responsive

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 93 of 1092

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APPENDIX F

PHOTOGRAPHS

FOIA Requested Record #J-15-0085 (CT)
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Photo 7006: Operations NCO - Computer workstation

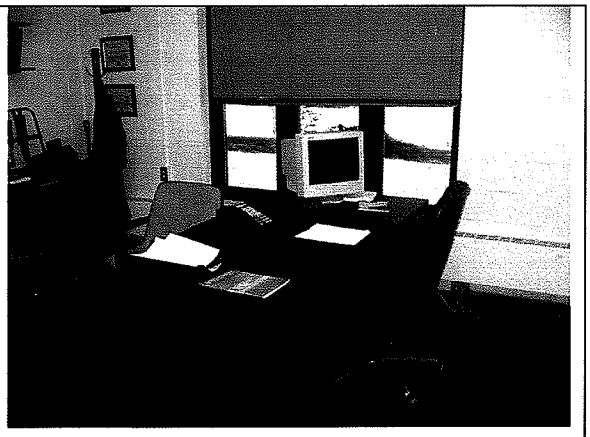

Photo 7007: BN Commander – Computer Workstation

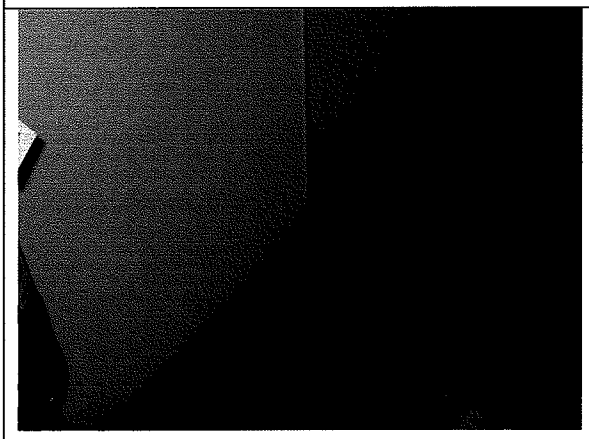

Photo 7021: Kitchen – Damaged asbestos-containing floor tile

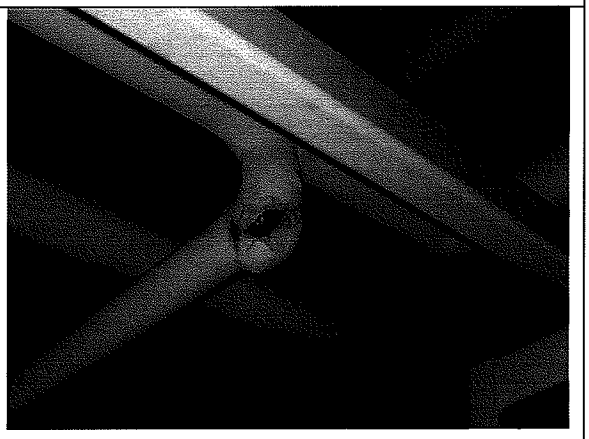

Photo 7024: Fitness Room – Damaged asbestos-containing pipe fitting insulation.

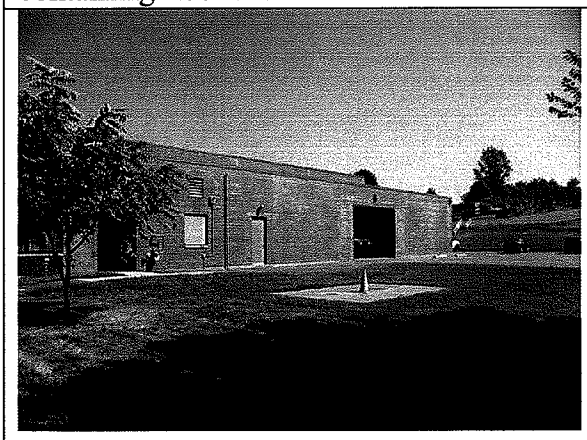

Photo 7025: Exterior View - Rear

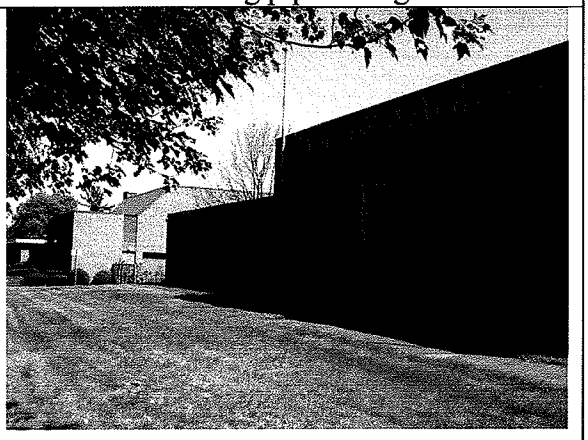

Photo 7027: Exterior View - Front

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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Industrial Hygiene Survey

Connecticut Army National Guard (CT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Enfield Readiness Center
1635 King Street
Enfield, CT 06082

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: August 27, 2012

AEI Project #: J12-676 3h CT Enfield RC

_____

Non-Responsive, **CIH, CSP, LEED Green Associate**
Industrial Hygienist

FOIA Requested Record #J-15-0085 (CT)
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Table of Contents

List of Tables and Appendices

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 100 of 1092

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) Enfield Readiness Center located at 1635 King Street, Enfield, CT 06082. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 27, 2012. The point of contact, civilian maintainer, Non-Responsive was not available on the day of the survey due to a scheduling problem. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: Peeling paint was observed on the ceiling in the fitness center. The paint chip sample was below 0.5% lead by weight and not considered lead-based paint. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot ($\mu g/ft^2$)) in all areas sampled.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. No damaged ACM was observed.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of mold growth or water damage was observed.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good.

Lighting: A lighting survey was performed in all accessible areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 14 foot candles (fc) to 130 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly acceptable compared to the comfort ranges for the summer season on the day of the survey. The outdoor temperature and relative humidity were 79.7° F and 70.1% on the day of monitoring, and indoor conditions were similar to outdoor conditions. The facility has air-conditioning units in some areas. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide were below the recommended concentrations in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available and MSDSs were locked in the custodian closet. The written Hazard Communication Program and MSDSs should always be readily available as required by the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200.

Overall, the Enfield Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 101 of 1092

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) Enfield Readiness Center located at 1635 King Street, Enfield, CT 06082. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 27, 2012. The point of contact would have been the civilian maintainer, Non-Responsive Non-Responsive however, Ms Non-Responsive was not available on the day of the survey due to a scheduling problem. Some areas of the facility were locked and could not be accessed. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Enfield Readiness Center was built in the 1960's. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Enfield Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Enfield facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state employed maintainer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 102 of 1092

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for damaged building materials that may contain asbestos or lead-based paint, for water damage or mold problems; for potential ergonomic problems; and for housekeeping practices. Lighting measurements were taken in all accessible areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the ceiling in the fitness center. A paint chip sample was collected and submitted for lead analysis. Results are given in Table 1 and certificates of analysis are included in Appendix B. The paint chip sample was below 0.5% lead by weight and was not considered lead-based paint.

Table 1 – Results of Paint Chip Sampling for CTARNG Enfield Readiness Center on August 27, 2012.

Sample #	Sample Location	Lead Result (% by wt)
ENF-B01	Peeling paint on the ceiling of the fitness center	0.16

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the state of Connecticut limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical Services, Inc. (AMA) of Lanham, MD for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Wipe samples collected from the facility were below the recommended maximum level for surface contamination in all areas sampled. Results are given in Table 2 and certificates of analysis are included in Appendix B.

Table 2 – Results of Dust Wipe Sampling for CTARNG Enfield Readiness Center on August 27, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
ENF-W01	Drill Hall – floor by recruiting booth	<110
ENF-W02	Drill Hall – floor by exit door	<110
ENF-W03	Drill Hall – top of footlocker	<110
ENF-W04	Drill Hall – top of amnesty box	<110
ENF-W05	Drill Hall – floor near bay door	<110
ENF-W06	Kitchen – counter near microwave	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft^2) lead on surfaces.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 103 of 1092

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged ACM was observed.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of water damage or mold growth was observed.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 14 foot candles (fc) to 130 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 3. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 104 of 1092

Table 3 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 76.9 to 81.7° F and 45.2 to 60.8% Rh. Temperatures and relative humidity measurements were mostly within the comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 79.7° F and 70.1%, and conditions inside were similar to the outdoor conditions. This readiness center has air-conditioning units in some areas and only one office was occupied on the day of the survey.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 376 to 645 parts per million (ppm). The outdoor CO_2 concentration was 328 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.1 to 0.3 ppm; therefore all measurements were below the concentrations of concern.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available and MSDSs were locked in the custodian closet. MSDSs and the written Hazard Communication Program should always be readily available as required by the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200.

7 Conclusions

The results of the evaluation indicated a few minor concerns at the facility. Overall, the Enfield Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 105 of 1092

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 106 of 1092

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12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 107 of 1092

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Appendix A
Building Layout

FOIA Requested Record #J-15-0085 (CT)
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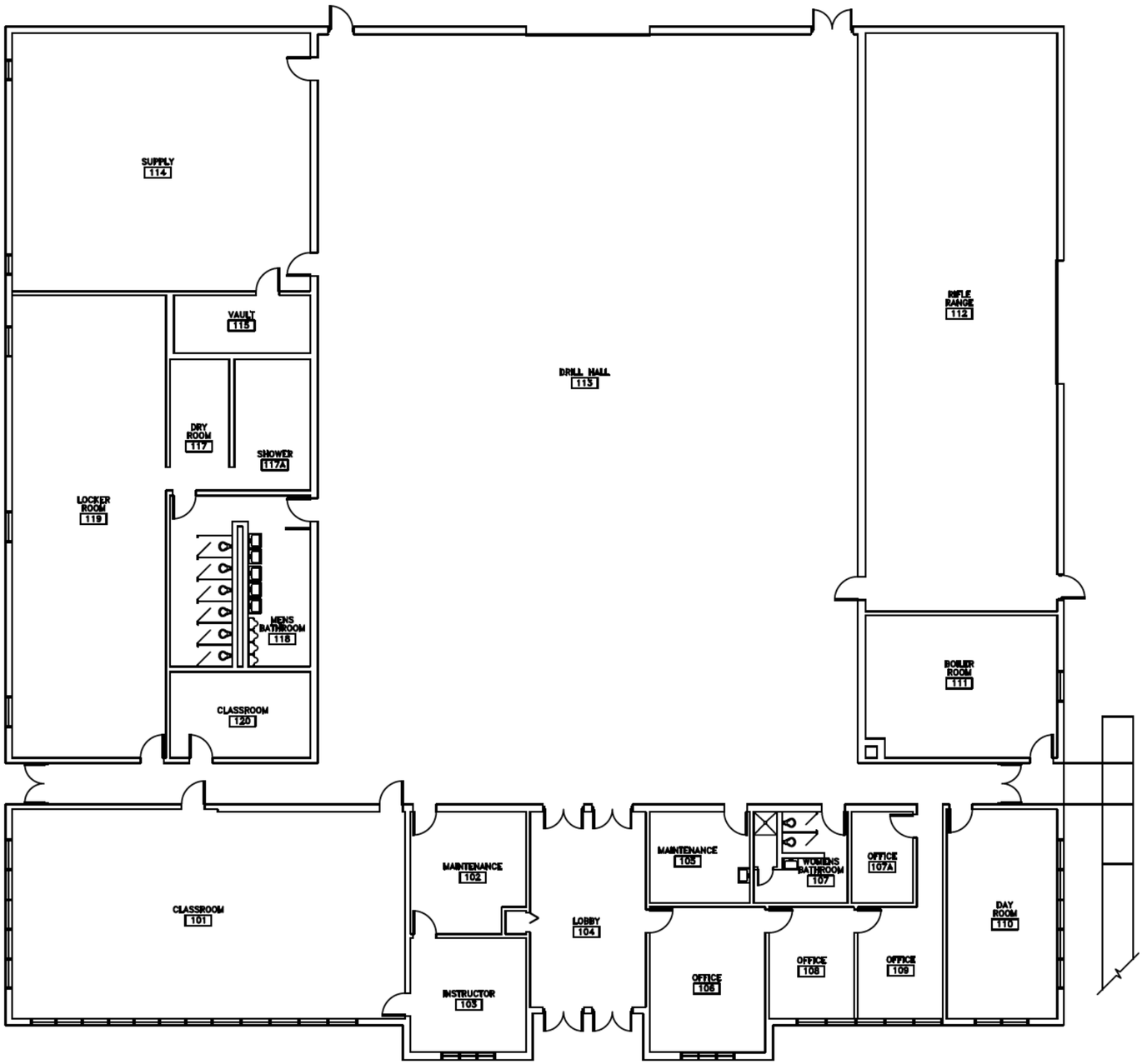

DRAWN BY: XX

FIRST FLOOR PLAN

EN - ENFIELD ARMORY
CONNECTICUT ARMY NATIONAL GUARD

ENFIELD, CONNECTICUT

12 SEPT 2006

0' 16'

STATE OF CONNECTICUT
MILITARY DEPARTMENT

Facilities Management Office

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Appendix B
Certificates of Analysis

FOIA Requested Record #J-15-0085 (CT)
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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Enfield RC	**Chain Of Custody:**	513790
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Enfield, CT	**Date Submitted:**	8/30/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/5/2012

Report Date: 9/6/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
12089826	ENF W 01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089827	ENF W 02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089828	ENF W 03	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089829	ENF W 04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089830	ENF W 05	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089831	ENF W 06	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089832	ENF B 01	Flame	Paint Chip	****	N/A	0.0097	%Pb		0.16	%Pb	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Analy Non-Responsive

Technical Manager: Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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Enfield RC
CTARNG

159202

210 REV. 6.08

AMA Analytical Services, Inc.

Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

OWI (410) 247-2024

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 513790

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: Enfield RC
2. Job Location: Enfield, CT
3. Job #: [redacted] #: W912K6-09-A-0003
4. Contact Per: [redacted]
5. Submitted [redacted] Signatur[redacted]

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
- ☐ Immediate Date Due:
- ☐ 24 Hours Time Due:
- Comments:

NORMAL BUSINESS HOURS
- ☐ Immediate ☐ 3 Day
- ☐ Next Day ☒ 5 Day + 8/7/12
- ☐ 2 Day Date Due:
- ☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
[redacted] h Report
ariaenviro.com
[redacted] us.army.mil
[redacted] us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☐ EPA 600 – Visual Estimate (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples ℃)

Metal Analysis
- ☐ Pb Paint Chip (QTY)
- ☐ Pb Dust Wipe (wipe type 10X10cm) 6 (QTY)
- ☐ Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples:
Collection Media:
- ☐ Spore-Trap (QTY)
- ☐ Surface Swab (QTY)
- ☐ Surface Tape (QTY)
- ☐ Other (Specify) (QTY)
- ☐ Surface Vacuum Dust (QTY)
- ☐ Culturable ID Genus (Media) (QTY)
- ☐ Culturable ID Species (Media) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WATER AND OTHER	SPORE TRAP	TAPE	SWAB

See attached Sheets

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 8 / 30 / 12 @ 1030 Via: FED EX By (Prin[redacted]
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments: 7987 2722 0273

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Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 8/27/12

Job Site: Enfield RC

Project No.: 512-676

Inspector: Non-Responsive

Sample No.	Sample Type	Sample Location	Dimensions (Area)
ENFW01	Lead	Drill shed floor, by recruiting booth	10 x 10 cm
ENFW02	↓	Drill shed floor, by exit door	
ENFW03		Drill shed floor, top of footlocker	
ENFW04		Drillshed floor, top of armoury box	
ENFW05		Drillshed floor, entrance door floor	
ENFW06		kitchen counter near microwave	
ENFB02	Lead	Gym ceiling paint	

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Appendix C
Photo Documentation

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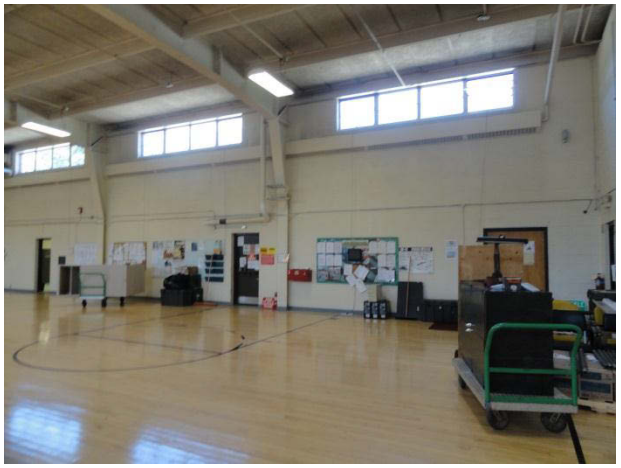
Enfield, CT Readiness Center

Drill Hall



Drill Hall

Kitchen

Kitchen

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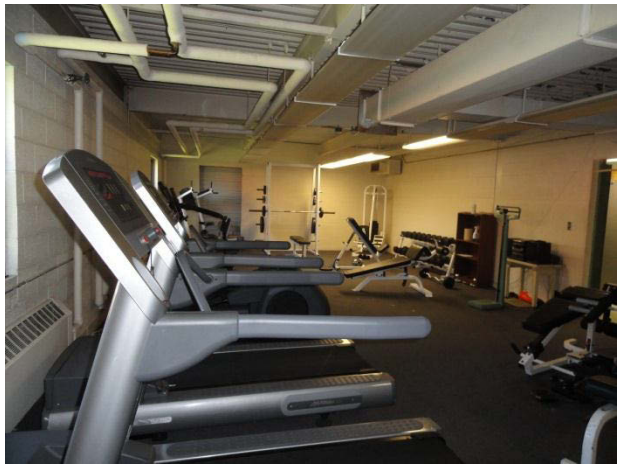
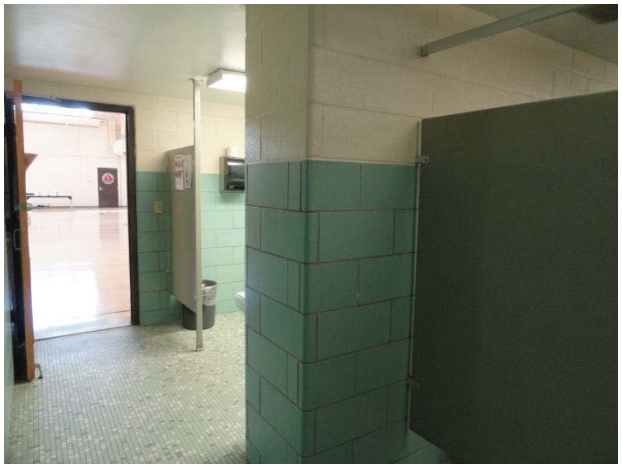
Enfield, CT Readiness Center



Fitness Center

Shower



Female Latrine

Office

FOIA Requested Record #J-15-0085 (CT)
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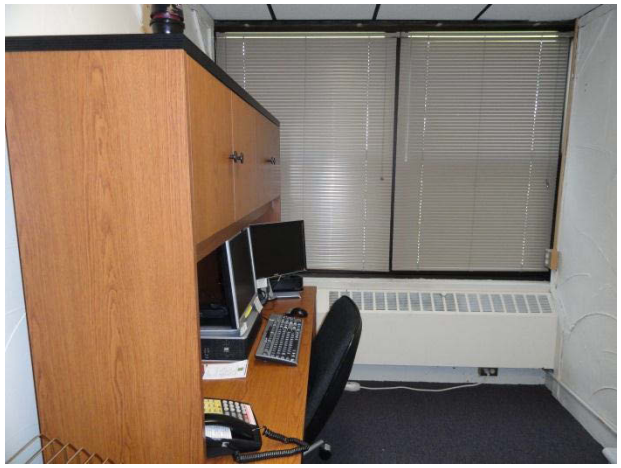
Enfield, CT Readiness Center



Office

Office

Office

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Appendix D
IAQ and Lighting Survey Log Sheets

FOIA Requested Record #J-15-0085 (CT)
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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	Enfield	IAQ								Light		
Date	8/27/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296						Serial Number		3021
Weather Conditions				Last Calibration		Mar-12						Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Drill Hall		2	11:37	81.7	X	53.1		585		0.3		30-52	X	50
Kitchen		2	12:04	79.7		56.7		645		0.1		50-180		50
Gym Area		2	12:05	79.1		57.6		421		0.1		14-188	X	30
Shower/Locker Room		2	12:06	78.2		60.8	X	376		0.2		80-110		7
Men's Bathroom		2	12:06									18-95		5
Office S1		3	12:08	76.9		45.2		406		0.0		60-130		30-50
Office S3		2	12:09	77.5		59.4		395		0.2		60-130		30-50
Office S4		2	12:10	81.4	X	52.6		456		0.0		15-120	X	30-50
Women's Bathroom		2	12:11									20-120		5
Outside				79.7		70.1		328		1.1				

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
HARTFORD ARMORY
HARTFORD, CONNECTICUT

February 2006
PN: 39741509

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 120 of 1092

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TABLE OF CONTENTS

Section **Page**

BEST AVAILABLE COPY

TABLE OF CONTENTS (Cont.)

APPENDICES

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in many of the offices.	Increase lighting in the administrative areas this may be accomplished through use of task lighting. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in a wipe sample collected from room 108 of the administrative area and the former firing range in an amount greater than or equal to 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the area where lead was detected in quantities of greater than or equal to 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Mold		
Water damaged and mold growth observed was observed throughout. Mold growth could become a significant issue if left unattended.	Determine and repair source of water. Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office , URS Corporation (URS) conducted an industrial hygiene survey at the Hartford Armory located at 360 Broad Street in Hartford, Connecticut 06105. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On September 16, 2005, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Hartford, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Mr. Non-Responsive site contact for this survey.

This armory is a four-story brick and block building, with an attached drill hall, that is constructed primarily of brick and mortar. This facility is built on a concrete slab with a pitched roof. Interior finishes include floor tile, suspended ceilings and drywall. The building was constructed in the 1890's. A layout drawing of the facility, which shows the sample locations is attached in Appendix A.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 124 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were given concerning workstations at the time of this survey.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the computer learning center, PSB, mailroom, records room, FMO room, USPFO office, penthouses and outside. These readings were all measured using a TSI Q-Trak ^{TM} (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 43% - 62% throughout the various building areas with an average of 53%. The average reading was below the recommended maximum level of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from a low of 580 to a spike of 1316 parts per million (ppm), with an average of 786 ppm. The outside reading was 440 ppm.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 125 of 1092

BEST AVAILABLE COPY

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 440 ppm on the day of the survey, the ASHRAE limit would be 1,140 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 0 to 3 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 126 of 1092

recommended lighting requirement (ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting lux / foot candles	Recommended Lighting lux / foot candles
Former Firing Range	Firing Range	282 / 32	500 / 50
1st Floor South Corridor, Center	Corridor	340 / 33	300 / 30
1st Floor Computer Learning Center	Classroom	353 / 29	500 / 50
1st Floor PSB	Office	432 / 40	500 / 50
Mailroom, 1st Floor	Office	322 / 30	500 / 50
2nd Floor drill Hall Beneath Balcony	Drill Hall	75.0 / 6	500 / 50
2nd Floor Drill Hall Center	Drill Hall	1720 / 156	500 / 50
2nd Floor Office Records Room 208	Office	590 / 55	500 / 50
2nd Floor Lobby	Lobby	650 / 61	500 / 50
2nd Floor FMO Room 224	Office	452 / 42	500 / 50
3rd Floor Room 313	Office	460 / 42	500 / 50
3rd Floor East Corridor	Corridor	210 / 10	300 / 30
3rd Floor USPFO, Room 300	Office	329 / 33	500 / 50
3rd Floor Lobby	Lobby	1725 / 169	500 / 50
3rd Floor West Corridor	Corridor	257 / 23	300 / 30
3rd Floor, Room 330	Office	273 / 25	500 / 50
3rd Floor, Room 329	Office	570 / 54	500 / 50
4th Floor Northwest Penthouse (OIC)	Office	770 / 72	500 / 50
4th Floor Northwest (2 man office)	Office	827 / 77	500 / 50
4th Floor Northwest (copier office)	Office	570 / 54	500 / 50
4th Floor Southwest Penthouse ([redacted] Office)	Office	439 / 41	500 / 50
4th Floor Southwest Penthouse ([redacted])	Office	335 / 31	500 / 50

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 127 of 1092

BEST AVAILABLE COPY

Table 2-1 (Cont)
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting lux / foot candles	Recommended Lighting lux / foot candles
4th Floor Southwest Penthouse (Non-Responsive)	Office	530 / 49	500 / 50
4th Floor Southeast Penthouse (Non-Responsive)	Office	355 / 33	500 / 50
4th Floor Southeast Penthouse (Non-Responsive)	Office	433 / 39	500 / 50
4th Floor Southeast Penthouse (Non-Responsive)	Office	465 / 43	500 / 50

On the day of the survey, lighting in most of the offices was inadequate. Please note that due to the conversion factor between foot candles and lux (1 lux equals 0.0929 foot candles), lighting may be compliant in lux but not in foot candles.

2.2.5 Lead

Wipe testing for lead dust was conducted in the administration area using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 2-2 below shows the results of the lead sampling.

Table 2-2
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Wipe Blank	0916-15	10x10 cm	<0.3	200
Hall Outside Room 109, Floor	0916-16	10x10 cm	13	200
Room 108, Floor	0916-17	10x10 cm	200	200
Room 111, Top of File Cabinet	0916-18	10x10 cm	3.4	200
Room 115, Top of Vending Machine	0916-19	10x10 cm	39	200
Hall Outside Room 135	0916-20	10x10 cm	71	200

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 128 of 1092

Table 2-2 (Cont)
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Hall Outside 106, Top of Electrical Box	0916-21	10x10 cm	14	200
Room 103, Window Sill	0916-22	10x10 cm	4.4	200
Hall Outside Main Entry, Top of Defibrillator Box	0916-23	10x10 cm	9.2	200
Community Learning Center, Shelf	0916-24	10x10 cm	3.4	200
Room 138, Electrical Box	0916-25	10x10 cm	36	200
Room 146, Top of Electrical Panel	0916-26	10x10 cm	5.9	200
1st Floor, Floor Outside Men's Room	0916-27	10x10 cm	3.1	200
Display Cabinet Outside Men's Room	0916-28	10x10 cm	<2.8	200
Display Cabinet Outside North Stairwell	0916-29	10x10 cm	<2.8	200
Shelf Outside Payroll	0916-30	10x10 cm	3.4	200
Main Lobby Floor	0916-31	10x10 cm	5.8	200
Floor Outside 112	0916-32	10x10 cm	110	200
Floor Outside Vault	0916-33	10x10 cm	44	200
Floor Outside 117	0916-34	10x10 cm	18	200
Floor Outside 120	0916-35	10x10 cm	20	200
Floor Outside 124	0916-36	10x10 cm	21	200
Floor Outside 126	0916-37	10x10 cm	14	200
Floor Outside 128	0916-38	10x10 cm	19	200
Window Sill Outside 222	0916-39	10x10 cm	4.5	200
Room 224 Cabinet	0916-40	10x10 cm	<2.8	200
Window Sill Outside Drill Hall Center	0916-41	10x10 cm	6.5	200
Window Sill Outside Drill Hall East	0916-42	10x10 cm	3.2	200
Room 209, File Cabinet	0916-43	10x10 cm	<2.8	200

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 129 of 1092

Table 2-2 (Cont)
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
2nd Floor Lobby Display Case	0916-44	10x10 cm	13	200
2nd Floor Lobby Floor	0916-45	10x10 cm	4.9	200
Room 215, Electrical Box	0916-46	10x10 cm	14	200
Room 212, Mantle	0916-47	10x10 cm	5.4	200
Room 215, Floor	0916-48	10x10 cm	72	200
Sheetrock Support Shelf, 3rd Floor East Hall	0916-49	10x10 cm	<2.8	200
3rd Floor East Hall, File cabinet	0916-50	10x10 cm	8.3	200
Stairwell 318 Floor	0916-51	10x10 cm	130	200
Window Sill to Drill Hall, East Hall	0916-52	10x10 cm	3.4	200
3rd Floor Southeast Stairwell Baluster	0916-53	10x10 cm	16	200
Window Sill Opposite 309	0916-54	10x10 cm	4.2	200
Locker Outside 325	0916-55	10x10 cm	23	200
Sheetrock Support, West Hall	0916-56	10x10 cm	<2.8	200
3rd Floor West Hall Window Sill	0916-57	10x10 cm	5.5	200
331 Stairwell Floor	0916-58	10x10 cm	3	200
4th Floor Audit, Window sill, Southeast	0916-59	10x10 cm	3.3	200
4th Floor Southwest Penthouse, Bookshelf	0916-60	10x10 cm	3.2	200
Northwest Penthouse Shelf	0916-61	10x10 cm	3	200

Sample numbers and locations can be found on the site map in Appendix A.

2.3 Ventilation System Evaluation

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 130 of 1092

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2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues regarding the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in the 1st floor computer learning center, 3rd floor corridors, room 230 and southeast penthouse. Personnel should supplement ambient light with task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: The dust wipe sample collected from room 108 of this facility was at 200 micrograms/ square foot. This is the maximum level recommended by the NGB Region North Industrial Hygiene Office. The U.S. Occupational Safety and Health Administration (OSHA) regulations, 29 CFR 1910.1025 and 29 CFR 1926.62 are designed to protect workers potentially exposed to elevated airborne levels of lead from lead-based paint. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 131 of 1092

3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now used for dining and storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Floor Near Cage Door Outside Bullet Trap	0916-10	10x10 cm	960	200
Floor Near Metal Stairs	0916-11	10x10 cm	87	200
Range Center Top of Pump Control Box	0916-12	10x10 cm	550	200
Range Center- Floor	0916-13	10x10 cm	95	200
Range-Bullet Trap to Boilers	0916-14	10x10 cm	8300	200

Sample numbers and locations can be found on the site map in Appendix A.

One air sample for lead dust was collected from the mess hall (former firing range). Table 3-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 132 of 1092

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Table 3-2
Airborne Concentration of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Lead Action Level ($\mu g/m^3$)
Former Firing Range Center	0916-01	234	<13	30.0
Blank	0916-03	N/A	<3 µg	N/A

Sample number and location can be found on the site map in appendix A.

On the day of the survey, the airborne lead dust level in the mess hall was found to be below the OSHA action level of 30.0 $\mu g/m^3$ averaged over an 8-hour day.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: One surface tested for lead in the former firing range was found to contain lead above the NGB Region North IH Office recommended 200 micrograms per square foot . The U.S. Occupational Safety and Health Administration (OSHA) regulations, 29 CFR 1910.1025 and 29 CFR 1926.62 are designed to protect workers potentially exposed to elevated airborne levels of lead. The NGB Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Appendix H contains guidelines for the cleaning and rehabilitation of former indoor firing ranges.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 133 of 1092

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4.0 DRILL HALL

4.1 Operation Description

The drill hall is an 8,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a hard wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall, Northeast Floor	0916-05	10x10 cm	15	200
Drill Hall, Northwest, Electrical Box	0916-06	10x10 cm	150	200
Drill Hall, Center, Floor	0916-07	10x10 cm	16	200
Drill Hall, Southeast, Floor	0916-08	10x10 cm	11	200
Drill Hall, Southwest, Floor	0916-09	10x10 cm	18	200
Blank	0916-04	N/A	<0.3	200

Sample numbers and locations can be found on the site map in Appendix A.

One air sample for lead dust was collected from drill hall. Table 4-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
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Page 134 of 1092

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Table 4-2
Airborne Concentration of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	Lead Exposure Limit ($\mu g/m^3$)
Drill Hall Center	0916-02	315	<9.5	30.0
Blank	0916-03	N/A	<3μg	N/A

On the day of the survey, the airborne lead dust level in the drill hall was found to be below the OSHA action level of 30.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

Mot applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be below allowable limits and require no cleaning or further testing. The NGB Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 135 of 1092

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5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

No chemical or physical agents were sampled in this area.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

No environmental, health or safety issues were observed in the boiler room.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 136 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was found regarding hazard communication. Training records are maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 137 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15, 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 138 of 1092

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APPENDIX A

ARMORY DRAWING

FOIA Requested Record #J-15-0085 (CT)
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Hartford Armory, CT

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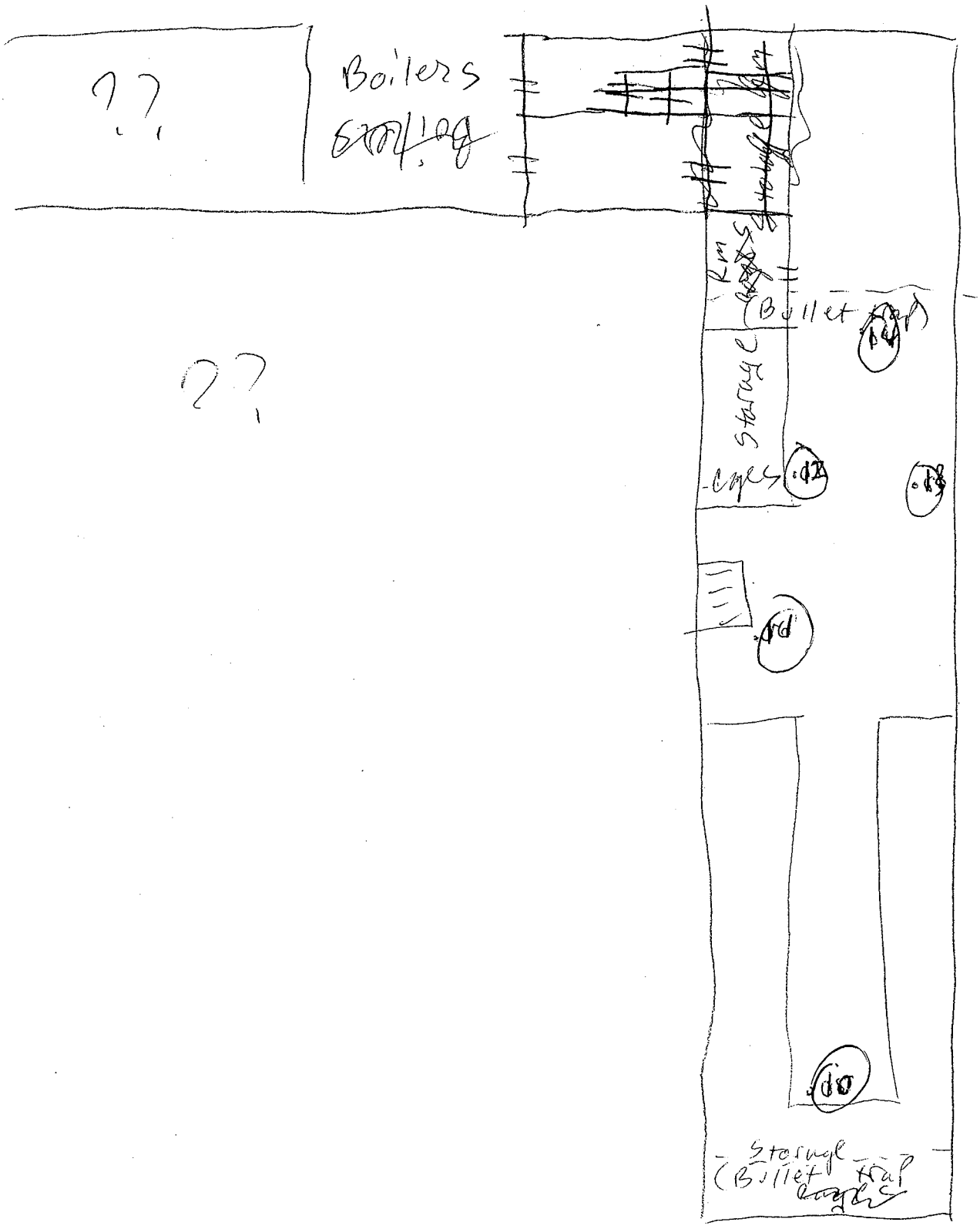

Basement

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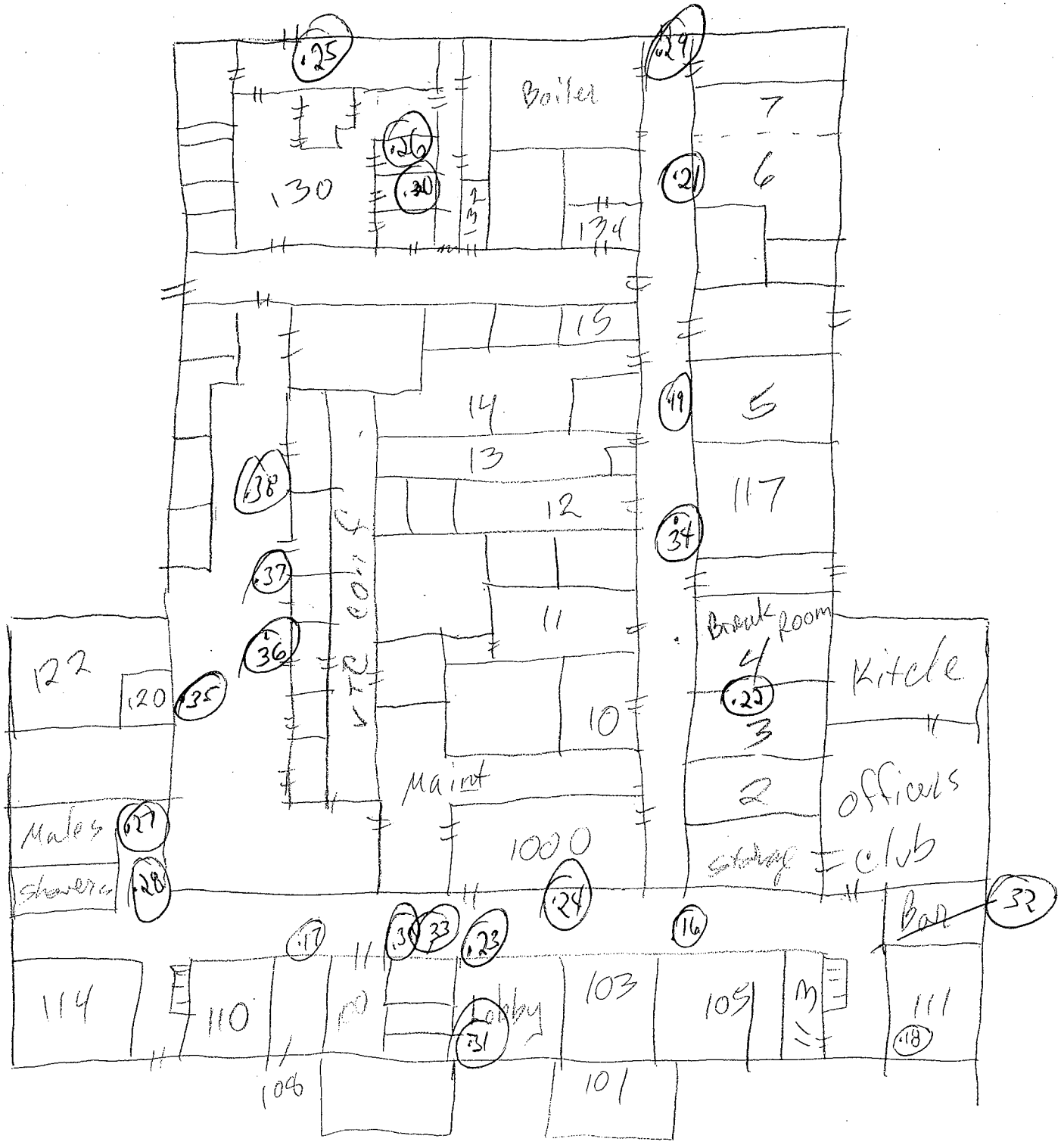

1st Floor

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Page 141 of 1092

Hartford Armory

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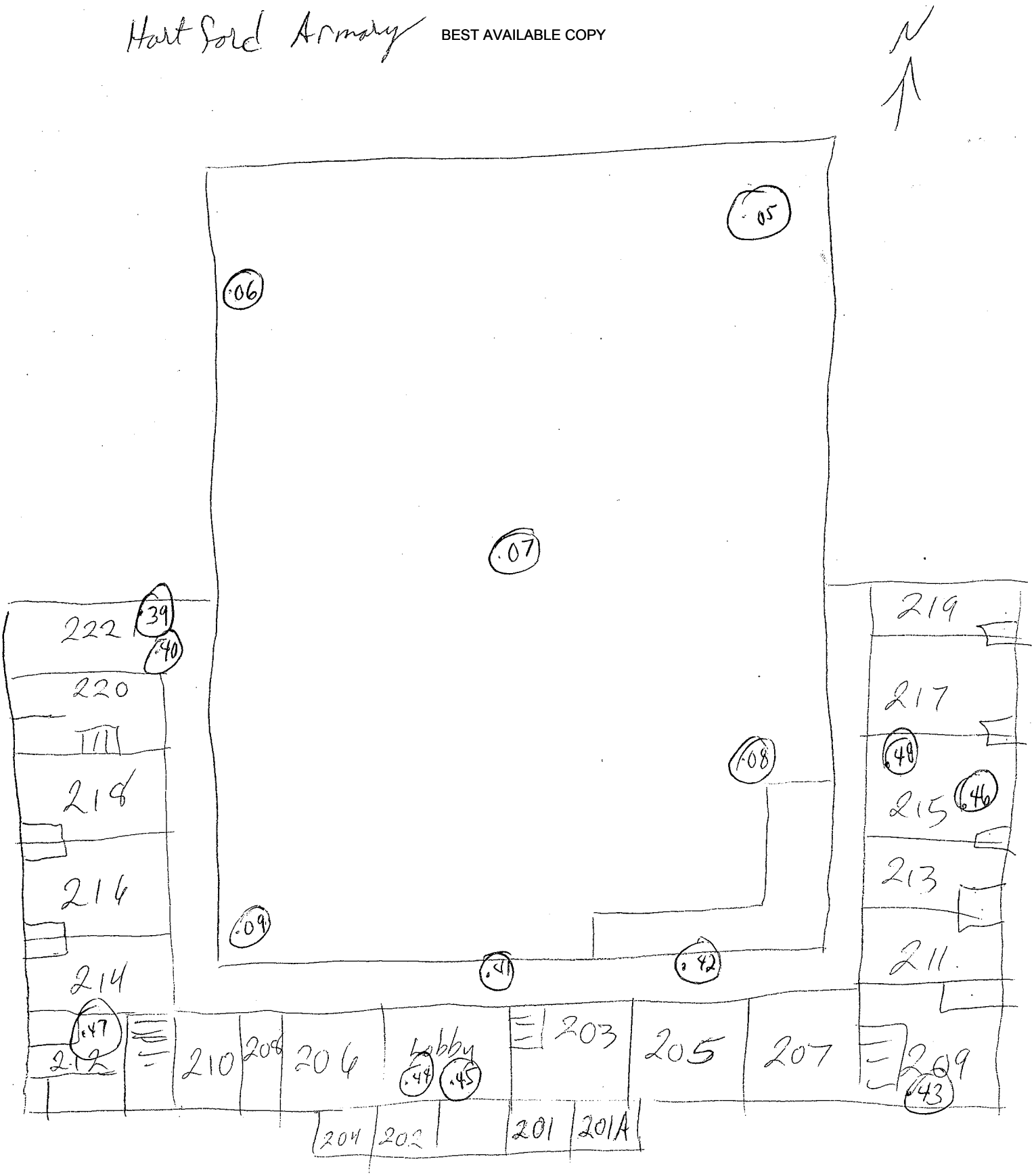

2nd Floor

Hartford Armory, CT

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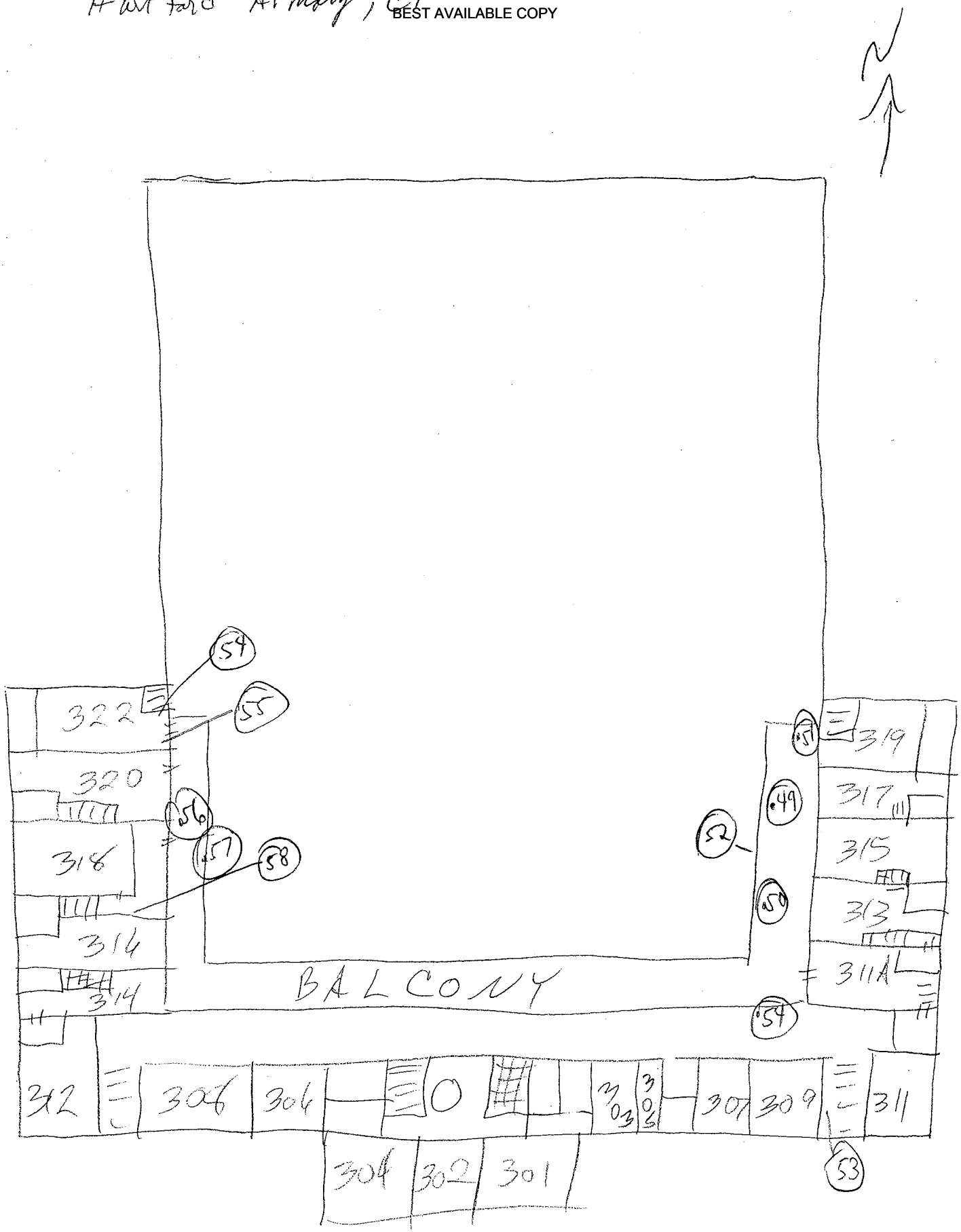

3rd Floor

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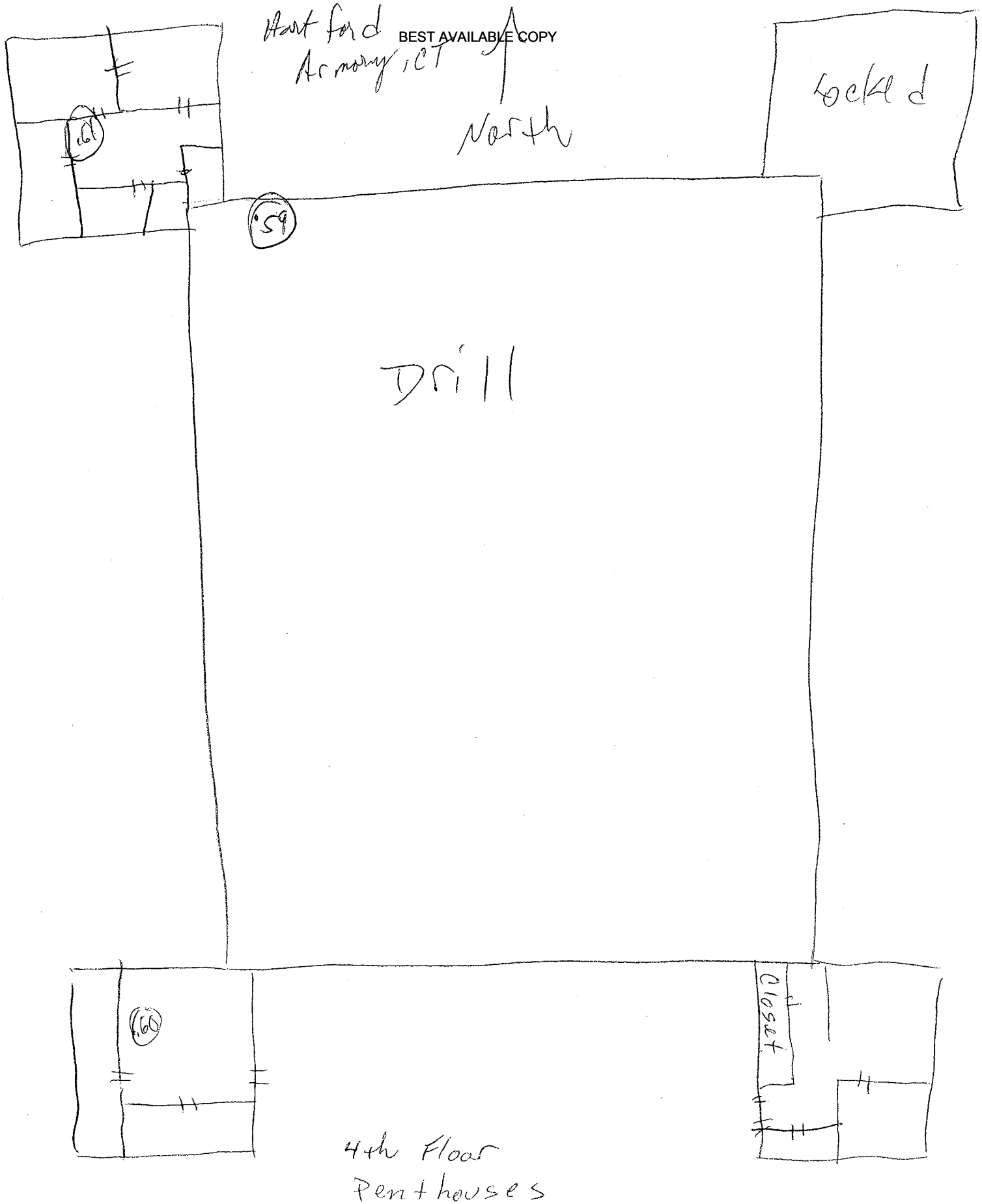

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APPENDIX B

PERSONNEL LIST

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APPENDIX C

HAZARDOUS MATERIALS LIST

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APPENDIX D

ANALYTICAL RESULTS

FOIA Requested Record #J-15-0085 (CT)
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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	14420
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Hartford Armory-360 Broad St Hartford CT	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	39741509.00401	**Date Analyzed:**	9/28/2005
Attention:	[redacted]				**Report Date:** 28-Sep-05

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0568327	0916 01	Flame	Air	234	N/A	12.82	ug/m³	<	13	ug/m³
0568328	0916 02	Flame	Air	315	N/A	9.52	ug/m³	<	9.5	ug/m³
0568329	0916 03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)
%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.
Air and Wipe results are not corrected for any blank results

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted] Non-Re

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Page 150 of 192

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Hartford Armory	**Chain Of Custody:**	144185
Address:	301-JH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Armory/Admin/Assembly	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	9/30/2005

Report Date: 04-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0568494	0916 04	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0568495	0916 05	Furnace	Wipe	****	0.111	2.70	ug/ft^2	15	ug/ft^2	
0568496	0916 06	Furnace	Wipe	****	0.111	67.51	ug/ft^2	150	ug/ft^2	
0568497	0916 07	Furnace	Wipe	****	0.111	2.70	ug/ft^2	16	ug/ft^2	
0568498	0916 08	Furnace	Wipe	****	0.111	2.70	ug/ft^2	11	ug/ft^2	
0568499	0916 09	Furnace	Wipe	****	0.111	2.70	ug/ft^2	18	ug/ft^2	
0568500	0916 10	Furnace	Wipe	****	0.111	135.01	ug/ft^2	960	ug/ft^2	
0568501	0916 11	Furnace	Wipe	****	0.111	67.51	ug/ft^2	87	ug/ft^2	
0568502	0916 12	Furnace	Wipe	****	0.111	67.51	ug/ft^2	550	ug/ft^2	
0568503	0916 13	Furnace	Wipe	****	0.111	67.51	ug/ft^2	95	ug/ft^2	
0568504	0916 14	Furnace	Wipe	****	0.111	3375.34	ug/ft^2	8300	ug/ft^2	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] **Technical Manager:** [redacted]

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorizatio from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Hartford Armory	**Chain Of Custody:**	145337
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Administration	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	11/9/2005
Attention:	[redacted]				**Report Date:** 09-Nov-05

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0604363	0916-15	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0604364	0916-16	Furnace	Wipe	****	0.108	2.79	ug/ft²	13	ug/ft²	
0604365	0916-17	Furnace	Wipe	****	0.108	69.70	ug/ft²	200	ug/ft²	
0604366	0916-18	Furnace	Wipe	****	0.108	2.79	ug/ft²	3.4	ug/ft²	
0604367	0916-19	Furnace	Wipe	****	0.108	13.94	ug/ft²	39	ug/ft²	
0604368	0916-20	Furnace	Wipe	****	0.108	69.70	ug/ft²	71	ug/ft²	
0604369	0916-21	Furnace	Wipe	****	0.108	2.79	ug/ft²	14	ug/ft²	
0604370	0916-22	Furnace	Wipe	****	0.108	2.79	ug/ft²	4.4	ug/ft²	
0604371	0916-23	Furnace	Wipe	****	0.108	2.79	ug/ft²	9.2	ug/ft²	
0604372	0916-24	Furnace	Wipe	****	0.108	2.79	ug/ft²	3.4	ug/ft²	
0604373	0916-25	Furnace	Wipe	****	0.108	13.94	ug/ft²	36	ug/ft²	
0604374	0916-26	Furnace	Wipe	****	0.108	2.79	ug/ft²	5.9	ug/ft²	
0604375	0916-27	Furnace	Wipe	****	0.108	2.79	ug/ft²	3.1	ug/ft²	
0604376	0916-28	Furnace	Wipe	****	0.108	2.79	ug/ft²	< 2.8	ug/ft²	
0604377	0916-29	Furnace	Wipe	****	0.108	2.79	ug/ft²	< 2.8	ug/ft²	
0604378	0916-30	Furnace	Wipe	****	0.108	13.94	ug/ft²	34	ug/ft²	
0604379	0916-31	Furnace	Wipe	****	0.108	2.79	ug/ft²	5.8	ug/ft²	
0604380	0916-32	Furnace	Wipe	****	0.108	69.70	ug/ft²	110	ug/ft²	
0604381	0916-33	Furnace	Wipe	****	0.108	13.94	ug/ft²	44	ug/ft²	
0604382	0916-34	Furnace	Wipe	****	0.108	2.79	ug/ft²	18	ug/ft²	

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NO.481 004
11/09/2005 AEROSOL MONITORING & ANALYSIS → 16038936240 PAGE 04
Page 153 of 202

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Hartford Armory	**Chain Of Custody:**	145337
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Administration	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	11/9/2005
Attention:	[redacted]				**Report Date:** 09-Nov-05

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0604383	0916-35	Furnace	Wipe	****	0.108	2.79	ug/ft²	20	ug/ft²	
0604384	0916-36	Furnace	Wipe	****	0.108	2.79	ug/ft²	21	ug/ft²	
0604385	0916-37	Furnace	Wipe	****	0.108	2.79	ug/ft²	14	ug/ft²	
0604386	0916-38	Furnace	Wipe	****	0.108	2.79	ug/ft²	19	ug/ft²	
0604387	0916-39	Furnace	Wipe	****	0.108	2.79	ug/ft²	4.5	ug/ft²	
0604388	0916-40	Furnace	Wipe	****	0.108	2.79	ug/ft²	< 2.8	ug/ft²	
0604389	0916-41	Furnace	Wipe	****	0.108	2.79	ug/ft²	6.5	ug/ft²	
0604390	0916-42	Furnace	Wipe	****	0.108	2.79	ug/ft²	3.2	ug/ft²	
0604391	0916-43	Furnace	Wipe	****	0.108	2.79	ug/ft²	< 2.8	ug/ft²	
0604392	0916-44	Furnace	Wipe	****	0.108	2.79	ug/ft²	13	ug/ft²	
0604393	0916-45	Furnace	Wipe	****	0.108	2.79	ug/ft²	4.9	ug/ft²	
0604394	0916-46	Furnace	Wipe	****	0.108	2.79	ug/ft²	14	ug/ft²	
0604395	0916-47	Furnace	Wipe	****	0.108	2.79	ug/ft²	5.4	ug/ft²	
0604396	0916-48	Furnace	Wipe	****	0.108	69.70	ug/ft²	72	ug/ft²	
0604397	0916-49	Furnace	Wipe	****	0.108	2.79	ug/ft²	< 2.8	ug/ft²	
0604398	0916-50	Furnace	Wipe	****	0.108	2.79	ug/ft²	8.3	ug/ft²	
0604399	0916-51	Furnace	Wipe	****	0.108	69.70	ug/ft²	130	ug/ft²	
0604400	0916-52	Furnace	Wipe	****	0.108	2.79	ug/ft²	3.4	ug/ft²	
0604401	0916-53	Furnace	Wipe	****	0.108	2.79	ug/ft²	16	ug/ft²	
0604402	0916-54	Furnace	Wipe	****	0.108	2.79	ug/ft²	4.2	ug/ft²	

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A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Hartford Armory	**Chain Of Custody:**	145337
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Administration	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted] Non-Resp
		P.O. Number:	Not Provided	**Date Analyzed:**	11/9/2005
Attention:	[redacted] Non-Resp			**Report Date:**	09-Nov-05

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0604403	0916-55	Furnace	Wipe	****	0.108	2.79	ug/ft²	23	ug/ft²	
0604404	0916-56	Furnace	Wipe	****	0.108	2.79	ug/ft²	< 2.8	ug/ft²	
0604405	0916-57	Furnace	Wipe	****	0.108	2.79	ug/ft²	5.5	ug/ft²	
0604406	0916-58	Furnace	Wipe	****	0.108	2.79	ug/ft²	3	ug/ft²	
0604407	0916-59	Furnace	Wipe	****	0.108	2.79	ug/ft²	3.3	ug/ft²	
0604408	0916-60	Furnace	Wipe	****	0.108	2.79	ug/ft²	3.2	ug/ft²	
0604409	0916-61	Furnace	Wipe	****	0.108	2.79	ug/ft²	3	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Resp

Technical Manager: [redacted] Non-Resp

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FOIA Requested Record #J-15-0058
Page 154 of 202
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APPENDIX E

TRAINING CERTIFICATES

FOIA Requested Record #J-15-0085 (CT)
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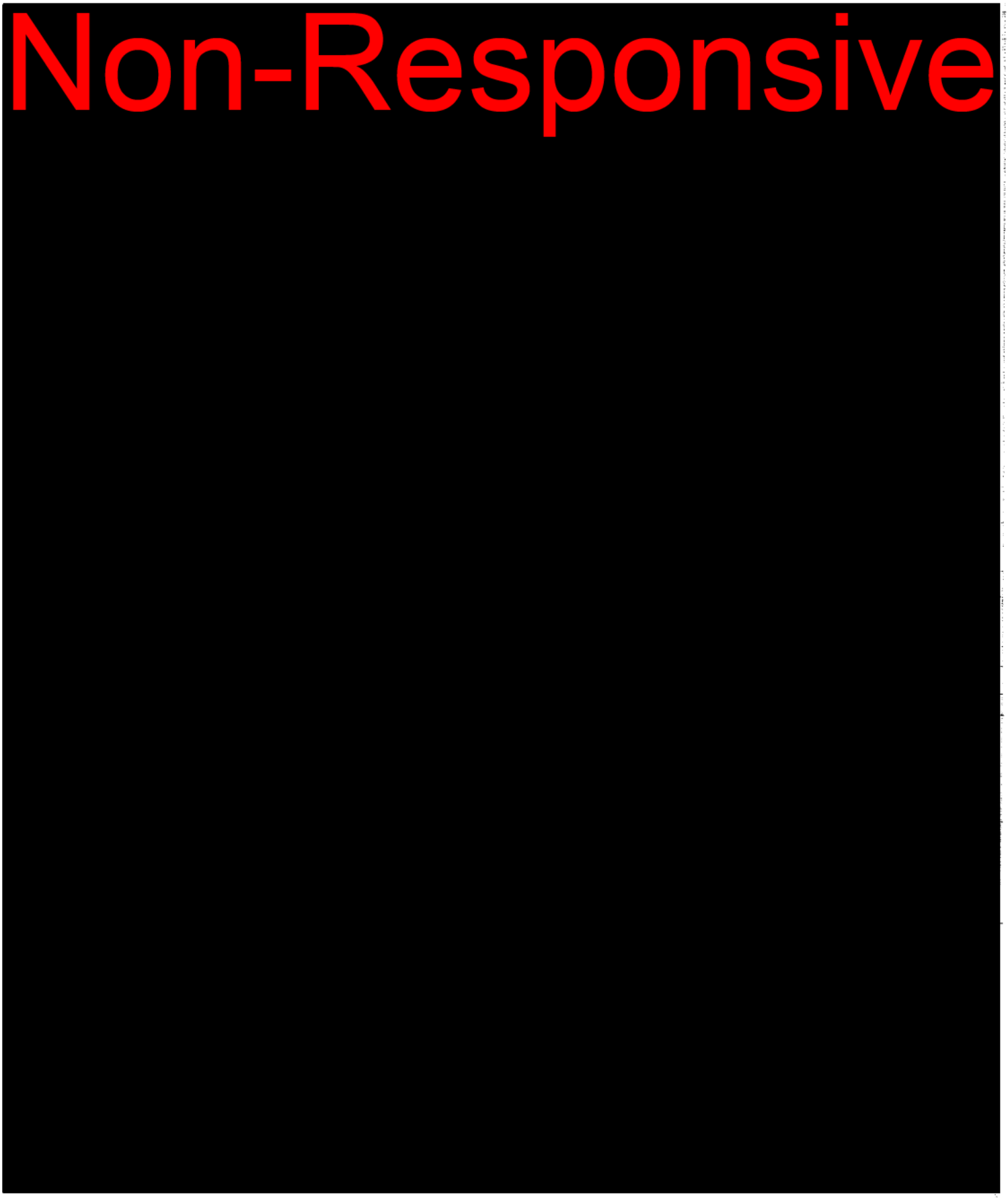

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Certificate of Training

Awarded to

[redacted] Non-Responsive

For successful completion of an 8 Hour, 1 Day

Asbestos Inspector & Management Planner
Annual Refresher Training

MARCH 25, 2003

This training was approved and given in accordance with Regulations for Connecticut State Agencies RCSA 20-440 - 1-9 and RCSA 20-441 and meets the requirements of the EPA Revised MAP under TSCA Title II of 4/4/94

Presented by

Mystic Air Quality Consultants, Inc.
1204 North Road, Groton, CT 06340 (800) 247-7746

Certificate Number: IMPR10543 **Exam Grade:** 100% **Expiration Date:** 03/25/2004

Exam Date: 03/25/2003

[redacted] Non-Responsive
IH, CSP, RS

[redacted] Non-Responsive
Training Director

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APPENDIX F

PHOTOGRAPHS

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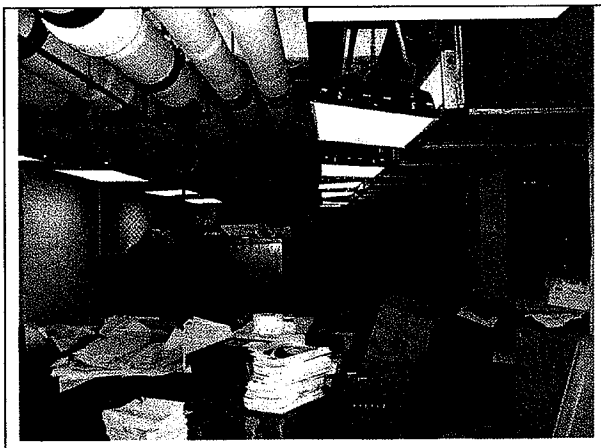

Photo 7115: Former Firing Range – Facing south

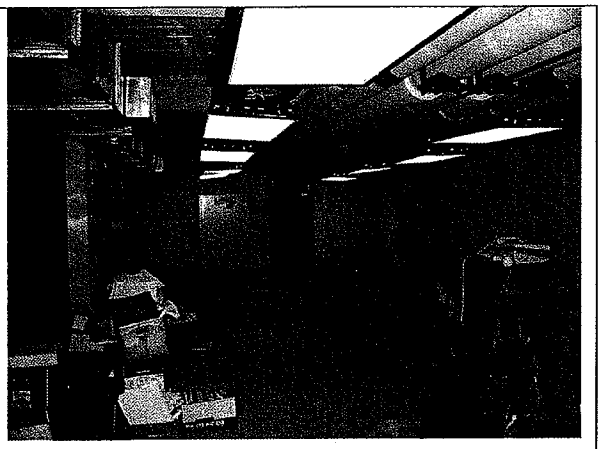

Photo 7116: Former Firing Range – Facing north

Photo 7117: Former Firing Range – Mold growth on drywall

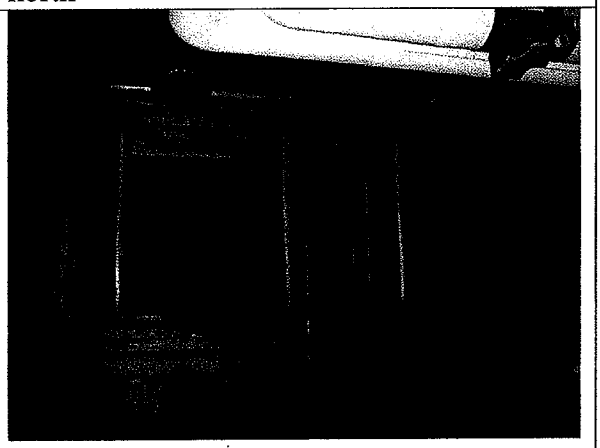

Photo 7118: Boiler Room – Old boilers (out of commission)

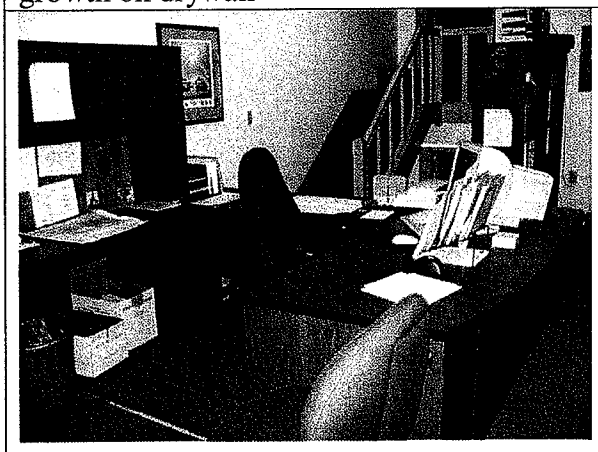

Photo 7120: Room 330 – Typical computer work station

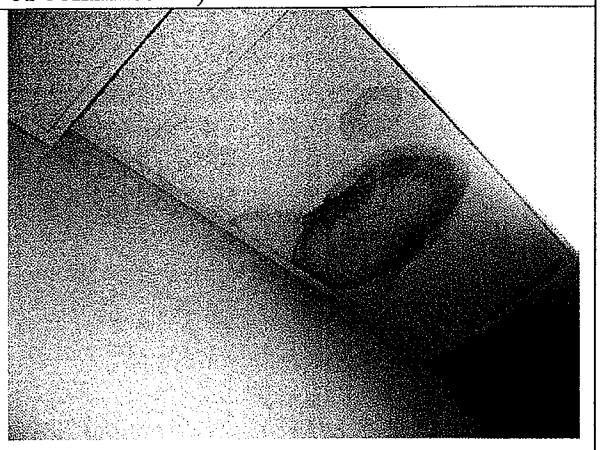

Photo 7121: Room 330 – Water stained ceiling tile

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Photo 7122: Room 330 – HVAC diffuser with significant dirt

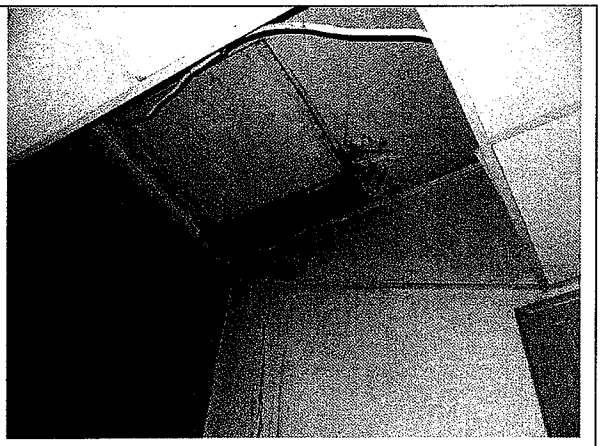

Photo 7124: Room 329 – Water leak

Photo 7126: Room 311 – Water damaged wall

Photo 7127: Room 311 – Water damage

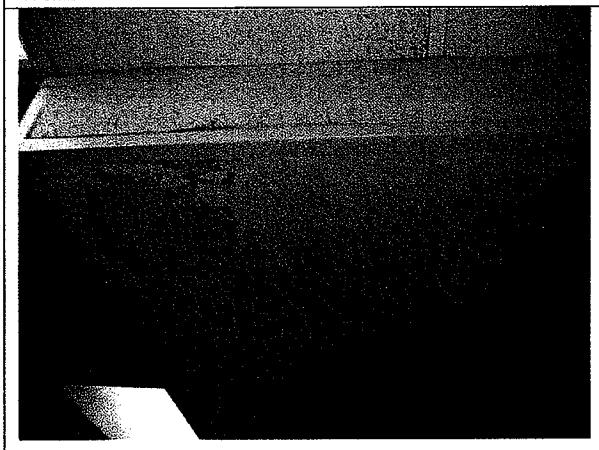

Photo 7135: Room 113 – Water damaged ceiling tile (leaking pipes)

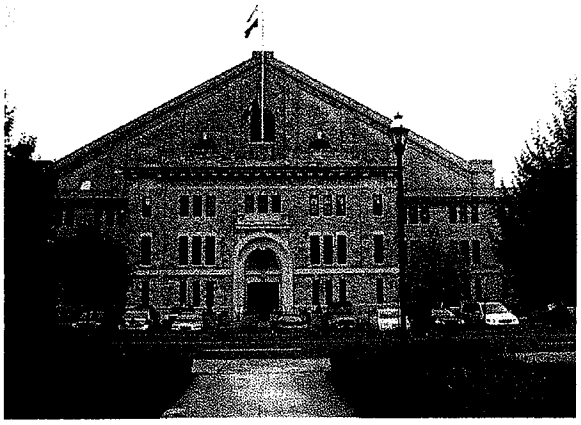

Photo 7138: Hartford Armory – Exterior view

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 161 of 1092

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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15, 30 DECEMBER 2002)

FOIA Requested Record #J-15-0085 (CT)
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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 165 of 1092

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3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman ™ #40 paper

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 166 of 1092

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(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

FOIA Requested Record #J-15-0085 (CT)
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Page 167 of 1092

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b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 168 of 1092

BEST AVAILABLE COPY

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 169 of 1092

BEST AVAILABLE COPY

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 170 of 1092

BEST AVAILABLE COPY

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 171 of 1092

BEST AVAILABLE COPY

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

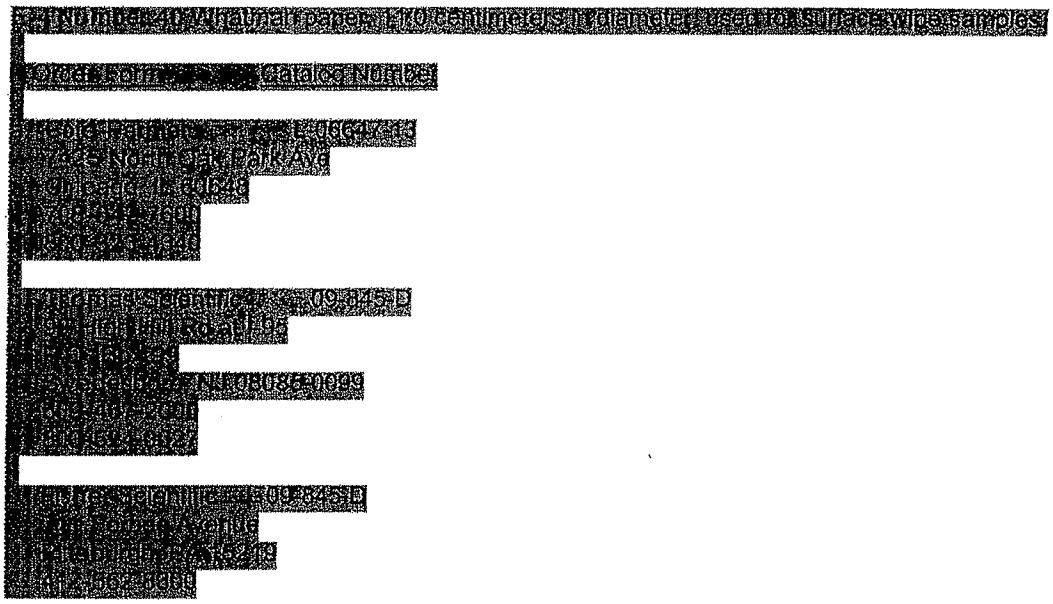
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 172 of 1092

BEST AVAILABLE COPY

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472



E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 173 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 174 of 1092

BEST AVAILABLE COPY

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet			
Return Address		Point of Contact *(name & phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			
Sampling Data			

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 175 of 1092

BEST AVAILABLE COPY

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		**Point of Contact** *(name/phone #)*	
		Samples Collected By	
Sampled Facility	**City**	**State**	**Location** *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	**Method of Collection**
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								***B***
Time On								***L***
Time Off								***A***
Total Time (min)								***N***
Flow Rate (LPM)								***K***
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 176 of 1092

BEST AVAILABLE COPY

APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 177 of 1092

BEST AVAILABLE COPY

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 178 of 1092

BEST AVAILABLE COPY

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 179 of 1092

BEST AVAILABLE COPY

CTNG-OHS
SUBJECT: Lead Air Sampling

CTNG-IH (40-5) 10 July 2008

MEMORANDUM FOR CTARNG, CFMO, Hartford Armory, 360 Broad Street, Hartford, CT 06105

SUBJECT: Lead Air Sampling

1. **References.**

A. OSHA Lead Standard for General Industry 29 CFR 1910.1025.

B. NIOSH 7300 Air Sampling Guidelines.

2. **Background:** On June 19, 2008 the CTARNG Occupational Health Office conducted air sampling for lead in the former indoor firing range at the Hartford Armory's basement. Previous surface lead wipe samples collected by third party companies confirmed the presence of lead in the former indoor firing range. The area is currently used for filing and storage. Air samples were collected to assess what lead dust levels individuals entering the area to store or move materials may have potentially been exposed to. The door to the area has been secured. Entering the area requires the use of gloves and shoe covers as a minimum.

3. **Method:** Air sampling for lead was performed using NIOSH 7300 as a reference. SKC Aircheck Sampler pumps model 224-44XR was used to conduct air sampling. Seven general area samples and two breathing zone samples were collected. Two field blanks were included in addition to the samples. Each pump was calibrated to 2 liters per minute (LPM) and was set to run for an 8 hour period (480 minutes) with preloaded, Mixed Cellulose Ester (MCE), .08 micrograms (ug), 37 millimeter (mm), 3 piece pre-banded cassettes. The pumps were pre calibrated the morning the sampling took place and post calibrated in the afternoon. Calibration was performed with a BIOS Dry Cal DC-Lite flow meter calibrated 02 January 2008. The following table shows the calibration results for each pump.

CALIBRATION LITERS/MINUTE			
PUMP NUMBER	PRE-USE	POST-USE	DATE
733737	2.029	1.958	19/ JUNE/08
733729	2.068	2.039	19/ JUNE/08
733778	2.060	1.425	19/ JUNE/08
733733	2.049	2.025	19/ JUNE/08
647746	2.065	2.043	19/ JUNE/08
733761	2.044	2.018	19/ JUNE/08
647880	2.055	2.019	19/ JUNE/08
647793	2.057	2.016	19/ JUNE/08
647878	2.032	2.029	19/ JUNE/08

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 180 of 1092

CTNG-OHS
SUBJECT: Lead Air Sampling

MAJ [redacted] and I (SGT [redacted]) wore the breathing zone media and air sampling pumps for an eight hour period. Tyvek ™ suits, gloves and shoe covers were worn during that period. While air sampling was taking place MAJ [redacted] and I spent the day moving boxes around from one place to another in each of the storage areas throughout the add previous indoor firing range. We also used the conveyer belt to move boxes from one end to the other several times during the day. To our understanding employees never spend 8hrs working in the area, this was done to simulate a worst case scenario for employees moving boxes or storing materials in the area. We only stopped for scheduled breaks. A map of the area where the sampling pumps were placed is included in this report.

4. **Exposure & Action Level:** Exposure to lead occurs through breathing or eating. Though lead is mostly excreted through the body rapidly within days, lead can build up in the body if the person is in contact with it repeatedly for a long time. According to the OSHA Lead Standard for the General Industry 29 CFR 1910.1025, the action level for airborne concentrations of lead is 30 micrograms per cubic meter (ug/m3) calculated as an 8 hour time weighted average. To be enrolled into a Medical Surveillance Program requires personnel to be exposed more than 30 days per year above the action level or exposed to 50 ug/m3 calculated as an 8 hour time weighted average. The signs and symptoms of lead poisoning are vague and can be easily confused with other conditions and vice versa. Acute health effects include encephalopathy which is any disease of the brain that alters the brain's function. It can be permanent or reversible. Chronic effects or long term exposure includes damage to the central nervous system, blood forming systems, urinary systems, and reproductive systems. The typical blood lead level in adults is less than 5 micrograms per deciliter (ug/dl).

5. **Lead Poisoning Prevention:** The best way to prevent lead poisoning is to remove it from the workplace (engineering controls). Lead poisoning can also be prevented by removing the worker from the contaminated area. If that is not possible, lead hazard training must be conducted and the employees must be provided with the personal protective equipment necessary to prevent exposure like Tyvek ™ or similar full body coveralls, gloves and shoe covers. If the lead levels are above the OSHA standard, respirators must be included as well as respirator fitting and a respiratory protection program. Personal protective equipment must be disposed of appropriately in a marked container to prevent the lead from being carried throughout the facility in accordance with the OSHA Lead Standard for the General Industry 29 CFR 1910.1025 which reads as follows:

The employer shall assure that the containers of contaminated protective clothing and equipment required by paragraph (g) (2) (v) of this section are labeled as follows: Caution: Clothing contaminated with lead. Do not remove dust by blowing or shaking. Dispose of lead contaminated wash water in accordance with applicable local, state, or federal regulations.

6. **Air Sample Results:** The sampling cassettes were sent to DATA CHEM Laboratories to be analyzed. The results were less than 0.0021 mg/m3 calculated as an eight hour time weighted average to less than 0.0018 mg/m3 eight hour time weighted

BEST AVAILABLE COPY

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 181 of 1092

average, well below the action level in accordance with the OSHA Lead Standard for the General Industry 29 CFR 1910.1025. A copy of the results as received from DATA CHEM Labs is included with this report as well as a copy of the OSHA standard.

SAMPLE #	RESULTS	STANDARD
L01 BZ	<0.0018 mg/m3 eight hour time weighted average	OSHA Lead Standard for the General Industry 29 CFR 1910.1025 Action level for airborne concentrations of lead is 30 ug/m3 time weighted average more than 30 days per year or 50 ug/m3 time weighted average per day.
L02 BZ	<0.0018 mg/m3 eight hour time weighted average	
L03 GA	<0.0021 mg/m3 eight hour time weighted average	
L04 GA	<0.0018 mg/m3 eight hour time weighted average	
L05 GA	<0.0018 mg/m3 eight hour time weighted average	
L06 GA	<0.0018 mg/m3 eight hour time weighted average	
L07 GA	<0.0018 mg/m3 eight hour time weighted average	
L08 GA	<0.0018 mg/m3 eight hour time weighted average	
L09 GA	<0.0018 mg/m3 eight hour time weighted average	
FBL01	FIELD BLANK	
FBL02	FIELD BLANK	

7. **Recommendations:**

a. A comprehensive lead cleaning in accordance with the requirements of NG Pam 420-15.

b. Conduct a lead hazard class to include personal protective equipment training for the personnel that need to enter the area.

c. Continue to limit access to the previous indoor firing range located in the basement area. If someone must enter the area to store materials they need to wear a minimum of gloves and shoe covers to prevent contamination by contact. In addition to gloves and shoe covers full body work clothing similar to the Tyvek ™ suits must be worn if employees are moving boxes around or working there for an extended amount of time to prevent lead dust from getting on their clothing.

d. Designate an area where personal protective equipment is to be worn, removed and disposed of properly. This area should have a sink available with soap and paper towels where personnel can wash exposed areas of skin.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 182 of 1092

CTNG-OHS
SUBJECT: Lead Air Sampling

e. Post lead hazard and point of contact signs on the doors that lead to the former indoor firing range until it is abated.

8. **Point of Contacts:** The undersigned can be reached at Non-Responsive or e-mail at Non-Responsive and MAJ Non-Responsive (Occupational Health Nurse) at

Non-Responsive
SGT, CTARNG
Occupational Health Specialist

cc:
CTARNG SOHN
NGB-ARS-IHNE

10 July 2008

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 183 of 1092

BEST AVAILABLE COPY

CTNG-OHS
SUBJECT: Lead Air Sampling

8175019

AIR SAMPLE DATA

8175019

use of this form see USAEHA TG 141; the proponent is MCHB-DC-LLC

~~ARMY NATIONAL GUARD~~
~~301-IH OLD BAY LANE~~
~~ATTN: (CHAPMAN)~~
~~HAVRE de GRACE, MD 21078-4094~~
~~410-542-0273 FAX 410-542-0254~~

CONNECTICUT ARMY NATIONAL GUARD
1109th AVCRAD
139 TOWER AVE ATTN: SGT [redacted]
GROTON, CT 06340
Non-Responsive

Point of Contact (name/AUTOVON)

Associated Bulk Samples ☐ Yes ☐ No

Bulk Sample No(s):

Sample Collected By:	Date Collected:	Date Shipped:
Non-Responsive	19/June/08	20/June/08

Project Number

Sampled Installation: HARTFORD ARMORY INACTIVE INDOOR FIRING RANGE BASEMENT USED FOR STORAGE

ARLOC

Location (BLDG/AREA): Basement

Description of Operation (details on reverse): Filing & Storage

2 Persons Exposed | 8 Hrs/Day

Method of Collection: NIOSH 7300

Preloaded Cassette, MCE, 0.8um, 37mm, 3 Piece Re Banded

Associated Complaints (be specific) (state NONE if applicable)

None

Analysis Desired

Lead - ICP-AES

Sampling Data

Sample No.	L01	L02	L03	L04	L05	L06	L07	FBL01
Pump No.	733737	733729	733778	733733	647746	733761	647880	
Time On	0730	0743	0750	0740	0748	0744	0735	B
Time Off	1530	1543	1550	1540	1548	1544	1535	L
Total Time (Min)	480	480	480	480	480	480	480	A
Flow Rate (LPM)	1.994	2.054	1.743	2.037	2.054	2.031	2.037	N
Volume (Liters)	957	986	837	978	986	975	978	K
GA/BZ	BZ	BZ	GA	GA	GA	GA	GA	
Employee Name/ID	JC3958	KK0900						
Laboratory No.								

Results

Comments to Lab: Please rush. Non-Responsive

Lab Us[redacted]

Analyst (initials) | Reviewed By (initials) | [redacted] te Dispatched

CHPPM Form 9-R-E, 1 May 96 Replaces AEHA Form 9

10 July 2008

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FOIA Requested Record #J-15-0085 (CT)
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CTNG-OHS
SUBJECT: Lead Air Sampling

AIR SAMPLE DATA

For use of this form see USAEHA TG 141; the proponent is MCHB-DC-LLC

~~ARMY NATIONAL GUARD~~ CONNECTICUT ARMY NATIONAL GUARD ~~301 IH OLD BAY LANE~~ 1109th AVCRAD ~~ATTN: (CHAPMAN)~~ 139 TOWER AVE ATTN: SGT [redacted] ~~HAVRE de GRACE, MD 21078-4094~~ GROTON, CT 06340 ~~410-942-0273 FAX 410-942-6254~~ [redacted]	Point of Contact (name/AUTOVON) Associated Bulk Samples ☐ Yes ☐ No Bulk Sample No(s):
Sample Collected By: [redacted]	Date Collected: 19 June 08 / Date Shipped: 20 June 08
Project Number	Sampled Installation HARTFORD ARMORY / NATIVE WOOD FIRING RANGE / BASEMENT USED FOR STORAGE — ARLOC
Location (BLDG/AREA): Basement	Description of Operation (details on reverse): Filing & Storage
2 Persons Exposed / 8 Hrs/Day	Method of Collection: NIOSH 7300 Pre loaded Cassette, MCE, 0.8um, 37mm, 3 Piece Pre Loaded
Associated Complaints (be specific) (state NONE if applicable): None	
Analysis Desired: Lead - ICP-AES	

Sampling Data

Sample No.	L08	L09						FBL02
Pump No.	647793	647878						
Time On	0737	0746						B
Time Off	1537	1546						L
Total Time (Min)	480	480						A
Flow Rate (LPM)	2.037	2.031						N
Volume (Liters)	978	975						K
GA/BZ	GA	GA						
Employee Name/ID								
Laboratory No.								

Results

Comments to Lab: Please rush. [redacted]

Lab U [redacted]

Analyst (initials)	Reviewed By (initials)	Date Dispatched

CHPPM Form 9-R-E, 1 May 96 Replaces AEHA Form

10 July 2008

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FOIA Requested Record #J-15-0085 (CT)
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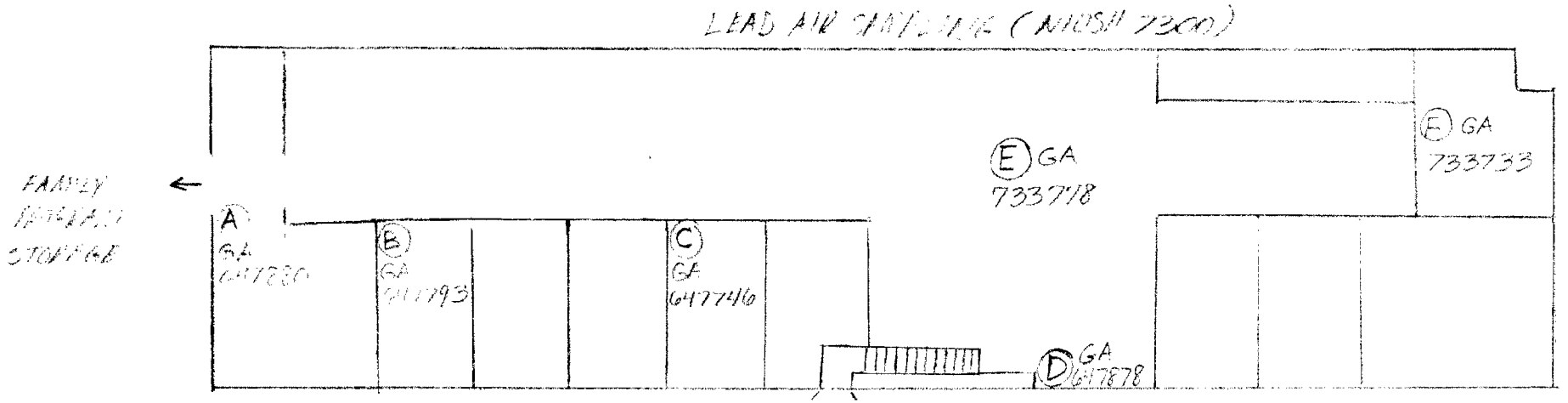
Page 185 of 1092

HARTFORD ARMORY

BASEMENT

FIRING RANGE

19/JUNE/2008



A L07/GA/RANGE TRAP
647880
0745-1525 / 460 min / 8hrs

B L08/GA/USMC STORAGE SPACE
647793
0737-1537 / 460 min / 8hrs

C L05/GA/ENVIRONMENTAL
647746
0748-1548 / 460 min / 8hrs

D L09/GA/CONVEYER BELT AREA
647878
0746-1546 / 460 min / 8hrs

E L03/GA/CENTER ROOM
733728
0750-1550 / 460 min / 8hrs

F L04/GA/BOILER/RECORDING STORAGE
733733
0740-1540 / 460 min / 8hrs

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FOIA Requested Record #J-15-0085 (CT)
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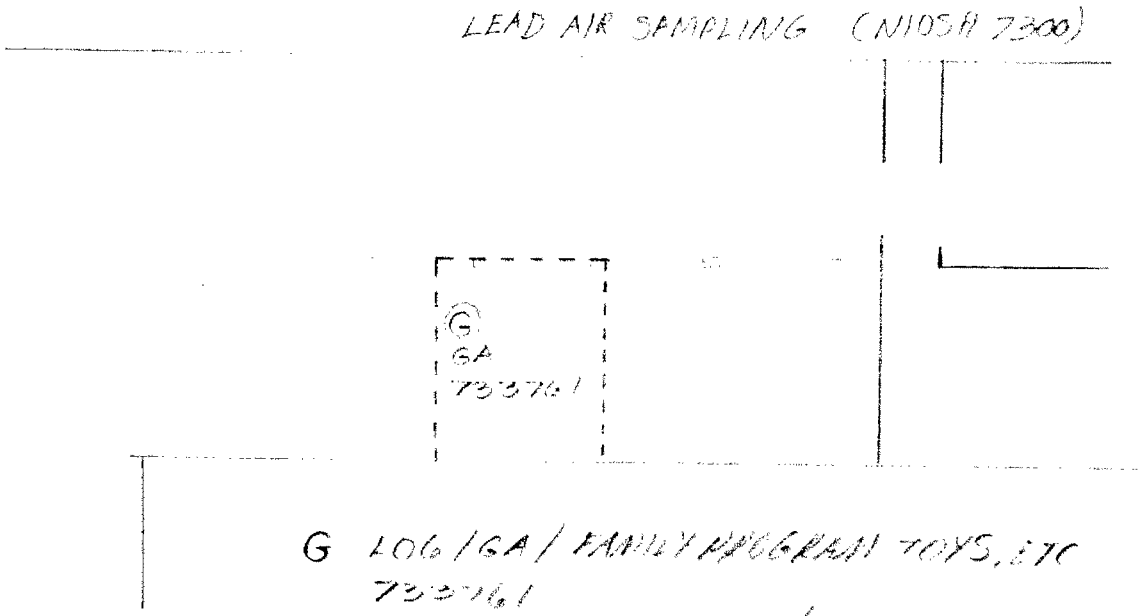
Page 186 of 1092

HARTFORD ARMORY
BASEMENT
FIRING RANGE

19 JUNE 2008



G 106/GA/ FAMILY PROGRAM TOYS, ETC
7537761
0749-1544 / 480 min / 8 hrs

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8175019

AIR SAMPLE DATA

8175019

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~~ARMY NATIONAL GUARD~~
~~301 IH OLD BAY LANE~~
~~ATTN: (CHAPMAN)~~
~~HAVRE de GRACE, MD 21078-4094~~
~~410-942-0273 FAX 410-942-0254~~

CONNECTICUT ARMY NATIONAL GUARD
1109th AVCRAD
139 TOWER AVE ATTN: SGT [redacted]
GROTON, CT 06340
Non-Responsive

Point of Contact (name/AUTOVON)

Associated Bulk Samples
☐ Yes ☐ No
Bulk Sample No(s):

Sample Collected By:	Date Collected:	Date Shipped:
Non-Responsive	19/June/08	20/June/08

Project Number

Sampled Installation: HARTFORD ARMORY
INACTIVE INDOOR FIRING RANGE
BASEMENT USED FOR STORAGE

ARLOC

Location *(BLDG/AREA)*: Basement

Description of Operation *(details on reverse)*: Filing & Storage

2 Persons Exposed | 8 Hrs/Day

Method of Collection: NIOSH 7300
Preloaded Cassette, MCE, 0.8um, 37mm, 3 Piece Pre Banded

Associated Complaints *(be specific) (state NONE if applicable)*: None

Analysis Desired: Lead - ICP-AES

Sampling Data

Sample No.	L01	L02	L03	L04	L05	L06	L07	FBL01
Pump No.	733737	733729	733778	733733	647746	733761	647880	
Time On	0730	0743	0750	0740	0748	0744	0735	B
Time Off	1530	1543	1550	1540	1548	1544	1535	L
Total Time (Min)	480	480	480	480	480	480	480	A
Flow Rate (LPM)	1.994	2.054	1.743	2.037	2.054	2.031	2.037	N
Volume (Liters)	957	986	837	978	986	975	978	K
GA/BZ	BZ	BZ	GA	GA	GA	GA	GA	
Employee Name/ID	JC3958	KK0900						
Laboratory No.								

Results

Comments to Lab: Please rush. Non-Responsive

Lab U[redacted] Non-Responsive

Analyst *(initials)*	Reviewed By *(initials)*	Date Dispatched

CHPPM Form 9-R-E, 1 May 96 Replaces AEHA Form [redacted]

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AIR SAMPLE DATA

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~~ARMY NATIONAL GUARD~~
~~301 IH OLD BAY LANE~~
~~ATTN: (CHAPMAN)~~
~~HAVRE de GRACE, MD 21078-4094~~
~~410-942-0273 FAX 410-942-0254~~

CONNECTICUT ARMY NATIONAL GUARD
1109th AVCRAD
139 TOWER AVE ATTN: SGT Non-Responsive
GROTON, CT 06340
Non-Responsive

Point of Contact (name/AUTOVON)

Associated Bulk Samples ☐ Yes ☐ No

Bulk Sample No(s):

Sample Collected By:	Date Collected:	Date Shipped:
Non-Responsive	19 June 08	20 June 08

Project Number

Sampled Installation: HARTFORD ARMORY
INACTIVE INDOOR FIRING RANGE
BASEMENT USED FOR STORAGE

ARLOC

Location *(BLDG/AREA)*: Basement

Description of Operation *(details on reverse)*: Firing & Storage

2 Persons Exposed | 8 Hrs/Day

Method of Collection: NIOSH 7300
Pre loaded Cassette, MCE, 0.8um, 37mm, 3 Piece Pre Banded

Associated Complaints *(be specific) (state NONE if applicable)*: None

Analysis Desired: Lead - ICP-AES

Sampling Data

Sample No.	L08	L09						FBL02
Pump No.	647793	647878						
Time On	0737	0746						B
Time Off	1537	1546						L
Total Time (Min)	480	480						A
Flow Rate (LPM)	2.037	2.031						N
Volume (Liters)	978	975						K
GA/BZ	GA	GA						
Employee Name/ID								
Laboratory No.								

Results

Comments to Lab: Please rush. Non-Responsive

Lab Use Only

Analyst *(initials)*	Reviewed By *(initials)*	Non-Responsive	Date Dispatched

CHPPM Form 9-R-E, 1 May 96 Replaces AEHA Form

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BILLING INSTRUCTIONS

SEND REPORT TO:

CONNECTICUT ARMY NATIONAL GUARD
ATTN: Non-Responsive
555 WILLARD AVE
NEWINGTON, CT 06111

CONNECTICUT ARMY NATIONAL GUARD
1109TH AVCRAD
ATTN: Non-Responsive
139 TOWER AVE
GROTON, CT 06340
PHONE: Non-Responsive

SEND BILL TO:

CONNECTICUT ARMY NATIONAL GUARD
1109TH AVCRAD
ATTN: Non-Responsive
139 TOWER AVE
GROTON, CT 06340
PHONE: Non-Responsive CALL : WILL PAY WITH GOVERNMENT CREDIT CARD

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DATA CHEM LABORATORIES, INC.

ANALYTICAL REPORT

Report Date: June 24, 2008

Non-Responsive
Conneticut Army National Guard
1109th AVCRAD
Groton, CT 06340

Phone: Non-Responsive

E-mail: Non-Responsive

Client Project ID: **Connecticut 062308**
DCL Workorder: **8175019**
DCL Project Manager: Non-Responsive

Analytical Results

Sample ID: **L01**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019001	Sampling Location: Basement	Received: 6/23/2008

Method: NIOSH 7300	Sampling Parameter: Air Volume 957 L			Prepared: 6/23/2008 Analyzed: 6/23/2008
Analyte	ug/sample	mg/m³	RL (ug/sample)	
Lead	<1.8	<0.0018	1.8	

Sample ID: **L02**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019002	Sampling Location: Basement	Received: 6/23/2008

Method: NIOSH 7300	Sampling Parameter: Air Volume 986 L			Prepared: 6/23/2008 Analyzed: 6/23/2008
Analyte	ug/sample	mg/m³	RL (ug/sample)	
Lead	<1.8	<0.0018	1.8	

Sample ID: **L03**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019003	Sampling Location: Basement	Received: 6/23/2008

Method: NIOSH 7300	Sampling Parameter: Air Volume 837 L			Prepared: 6/23/2008 Analyzed: 6/23/2008
Analyte	ug/sample	mg/m³	RL (ug/sample)	
Lead	<1.8	<0.0021	1.8	

Sample ID: **L04**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019004	Sampling Location: Basement	Received: 6/23/2008

Method: NIOSH 7300	Sampling Parameter: Air Volume 978 L			Prepared: 6/23/2008 Analyzed: 6/23/2008
Analyte	ug/sample	mg/m³	RL (ug/sample)	
Lead	<1.8	<0.0018	1.8	

Sample ID: **L05**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019005	Sampling Location: Basement	Received: 6/23/2008

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Page 191 of 1092

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DATA CHEM LABORATORIES, INC.

ANALYTICAL REPORT

Client Project ID: **Connecticut 062308**
DCL Workorder: **8175019**
DCL Project Manager: [redacted]

Analytical Results

Sample ID: **L05**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019005	Sampling Location: Basement	Received: 6/23/2008
Method: NIOSH 7300	Sampling Parameter: Air Volume 986 L	Prepared: 6/23/2008 Analyzed: 6/23/2008

Analyte	ug/sample	mg/m³	RL (ug/sample)
Lead	<1.8	<0.0018	1.8

Sample ID: **L06**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019006	Sampling Location: Basement	Received: 6/23/2008
Method: NIOSH 7300	Sampling Parameter: Air Volume 975 L	Prepared: 6/23/2008 Analyzed: 6/23/2008

Analyte	ug/sample	mg/m³	RL (ug/sample)
Lead	<1.8	<0.0018	1.8

Sample ID: **L07**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019007	Sampling Location: Basement	Received: 6/23/2008
Method: NIOSH 7300	Sampling Parameter: Air Volume 978 L	Prepared: 6/23/2008 Analyzed: 6/23/2008

Analyte	ug/sample	mg/m³	RL (ug/sample)
Lead	<1.8	<0.0018	1.8

Sample ID: **FBL01**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019008	Sampling Location: Basement	Received: 6/23/2008
Method: NIOSH 7300	Sampling Parameter: Air Volume Not Provided	Prepared: 6/23/2008 Analyzed: 6/23/2008

Analyte	ug/sample	mg/m³	RL (ug/sample)
Lead	<1.8	NA	1.8

Sample ID: **L08**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019009	Sampling Location: Basement	Received: 6/23/2008
Method: NIOSH 7300	Sampling Parameter: Air Volume 978 L	Prepared: 6/23/2008 Analyzed: 6/23/2008

Analyte	ug/sample	mg/m³	RL (ug/sample)
Lead	<1.8	<0.0018	1.8

Sample ID: **L09**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019010	Sampling Location: Basement	Received: 6/23/2008

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Page 192 of 1092

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DATA CHEM LABORATORIES, INC.

ANALYTICAL REPORT

Client Project ID: **Connecticut 062308**
DCL Workorder: **8175019**
DCL Project Manager [redacted]

Analytical Results

Sample ID: **L09**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019010	Sampling Location: Basement	Received: 6/23/2008
Method: NIOSH 7300	Sampling Parameter: Air Volume 975 L	Prepared: 6/23/2008 Analyzed: 6/23/2008

Analyte	ug/sample	mg/m³	RL (ug/sample)
Lead	<1.8	<0.0018	1.8

Sample ID: **FBL02**	Media: MCE Filter	Collected: 6/19/2008
Lab ID: 8175019011	Sampling Location: Basement	Received: 6/23/2008
Method: NIOSH 7300	Sampling Parameter: Air Volume Not Provided	Prepared: 6/23/2008 Analyzed: 6/23/2008

Analyte	ug/sample	mg/m³	RL (ug/sample)
Lead	<1.8	NA	1.8

Report Authorization

Method: NIOSH 7300

[redacted] _____
Analyst

[redacted] _____
Peer Review

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
ND = Not Detected, Testing result not detected above the LOD or LOQ.
** No result could be reported, see sample comments for details.
< This testing result is less than the numerical value.
() This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of DataChem Laboratories, Inc.

DataChem Laboratories, Inc. is accredited by AIHA for specific fields of testing as documented in its current scope of accreditation (ID#101574) which is available on request by contacting your project manager or view on the internet at http://www.aiha.org. The quality systems implemented in the laboratory apply to all methods performed by DataChem regardless of this current scope of accreditation which does not include performance based methods, modified methods, and methods

DataChem Laboratories, Inc. provides professional analytical services for all samples submitted. DataChem Laboratories, Inc. is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

960 West LeVoy Drive / Salt Lake City, UT 84123-2547
Phone: (801) 266-7700 Web: www.datachem.com
Fax: (801) 268-9992 Email: lab@datachem.com

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Page 193 of 1092

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Regulations (Standards - 29 CFR)

Lead. - 1910.1025

1910.1025(a)
Scope and application.
1910.1025(a)(1)
This section applies to all occupational exposure to lead, except as provided in paragraph (a)(2).
1910.1025(a)(2)
This section does not apply to the construction industry or to agricultural operations covered by 29 CFR Part 1928.
1910.1025(b)
Definitions.

"Action level" means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 ug/m(3)) averaged over an 8-hour period.

"Assistant Secretary" means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

"Director" means the Director, National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health, Education, and Welfare, or designee.

"Lead" means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.
1910.1025(c)
Permissible exposure limit (PEL).
1910.1025(c)(1)
The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 ug/m(3)) averaged over an 8-hour period.
1910.1025(c)(2)
If an employee is exposed to lead for more than 8 hours in any work day, the permissible exposure limit, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:

Maximum permissible limit (in ug/m(3))=400 divided by hours worked in the day.
1910.1025(c)(3)
When respirators are used to supplement engineering and work practice controls to comply with the PEL and all the requirements of paragraph (f) have been met, employee exposure, for the purpose of determining whether the employer has complied with the PEL, may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.
1910.1025(d)
Exposure monitoring -
1910.1025(d)(1)
General.
1910.1025(d)(1)(i)
For the purposes of paragraph (d), employee exposure is that exposure which would occur if the employee were not using a respirator.
1910.1025(d)(1)(ii)
With the exception of monitoring under paragraph (d)(3), the employer shall collect full shift (for at least 7 continuous hours) personal samples including at least one sample for each shift for each job classification in each work area.
1910.1025(d)(1)(iii)

Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

1910.1025(d)(2)

Initial determination. Each employer who has a workplace or work operation covered by this standard shall determine if any employee may be exposed to lead at or above the action level.

1910.1025(d)(3)

Basis of initial determination.

1910.1025(d)(3)(i)

The employer shall monitor employee exposures and shall base initial determinations on the employee exposure monitoring results and any of the following, relevant considerations:

1910.1025(d)(3)(i)(A)

Any information, observations, or calculations which would indicate employee exposure to lead;

1910.1025(d)(3)(i)(B)

Any previous measurements of airborne lead; and

1910.1025(d)(3)(i)(C)

Any employee complaints of symptoms which may be attributable to exposure to lead.

1910.1025(d)(3)(ii)

Monitoring for the initial determination may be limited to a representative sample of the exposed employees who the employer reasonably believes are exposed to the greatest airborne concentrations of lead in the workplace.

1910.1025(d)(3)(iii)

Measurements of airborne lead made in the preceding 12 months may be used to satisfy the requirement to monitor under paragraph (d)(3)(i) if the sampling and analytical methods used meet the accuracy and confidence levels of paragraph (d)(9) of this section.

1910.1025(d)(4)

Positive initial determination and initial monitoring.

1910.1025(d)(4)(i)

Where a determination conducted under paragraphs (d)(2) and (3) of this section shows the possibility of any employee exposure at or above the action level, the employer shall conduct monitoring which is representative of the exposure for each employee in the workplace who is exposed to lead.

1910.1025(d)(4)(ii)

Measurements of airborne lead made in the preceding 12 months may be used to satisfy this requirement if the sampling and analytical methods used meet the accuracy and confidence levels of paragraph (d)(9) of this section.

1910.1025(d)(5)

Negative initial determination. Where a determination, conducted under paragraphs (d)(2) and (3) of this section is made that no employee is exposed to airborne concentrations of lead at or above the action level, the employer shall make a written record of such determination. The record shall include at least the information specified in paragraph (d)(3) of this section and shall also include the date of determination, location within the worksite, and the name and social security number of each employee monitored.

1910.1025(d)(6)

Frequency.

1910.1025(d)(6)(i)

If the initial monitoring reveals employee exposure to be below the action level the measurements need not be repeated except as otherwise provided in paragraph (d)(7) of this section.

1910.1025(d)(6)(ii)

If the initial determination or subsequent monitoring reveals employee exposure to be at or above the action level but below the permissible exposure limit the employer shall repeat monitoring in accordance with this paragraph at least every 6 months. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level at

which time the employer may discontinue monitoring for that employee except as otherwise provided in paragraph (d)(7) of this section.

1910.1025(d)(6)(iii)

If the initial monitoring reveals that employee exposure is above the permissible exposure limit the employer shall repeat monitoring quarterly. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the PEL but at or above the action level at which time the employer shall repeat monitoring for that employee at the frequency specified in paragraph (d)(6)(ii), except as otherwise provided in paragraph (d)(7) of this section.

1910.1025(d)(7)

Additional monitoring. Whenever there has been a production, process, control or personnel change which may result in new or additional exposure to lead, or whenever the employer has any other reason to suspect a change which may result in new or additional exposures to lead, additional monitoring in accordance with this paragraph shall be conducted.

1910.1025(d)(8)

Employee notification.

1910.1025(d)(8)(i)

The employer must, within 15 working days after the receipt of the results of any monitoring performed under this section, notify each affected employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to affected employees.

1910.1025(d)(8)(ii)

Whenever the results indicate that the representative employee exposure, without regard to respirators, exceeds the permissible exposure limit, the employer shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action taken or to be taken to reduce exposure to or below the permissible exposure limit.

1910.1025(d)(9)

Accuracy of measurement. The employer shall use a method of monitoring and analysis which has an accuracy (to a confidence level of 95%) of not less than plus or minus 20 percent for airborne concentrations of lead equal to or greater than 30 ug/m(3).

1910.1025(e)

Methods of compliance -

1910.1025(e)(1)

Engineering and work practice controls.

1910.1025(e)(1)(i)

Where any employee is exposed to lead above the permissible exposure limit for more than 30 days per year, the employer shall implement engineering and work practice controls (including administrative controls) to reduce and maintain employee exposure to lead in accordance with the implementation schedule in Table I below, except to the extent that the employer can demonstrate that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest feasible level and shall supplement them by the use of respiratory protection which complies with the requirements of paragraph (f) of this section.

1910.1025(e)(1)(ii)

Where any employee is exposed to lead above the permissible exposure limit, but for 30 days or less per year, the employer shall implement engineering controls to reduce exposures to 200 ug/m(3), but thereafter may implement any combination of engineering, work practice (including administrative controls), and respiratory controls to reduce and maintain employee exposure to lead to or below 50 ug/m(3)

TABLE I

Industry	Compliance dates(1): (50 UG/M(3))

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Lead chemicals, secondary copper smeting.	July 19, 1996.
Nonferrous foundries.	July 19, 1996(2).
Brass and bronze ingot manufacture.	6 years(3).

Footnote(1) Calculated by counting from the date the stay on implementation of paragraph (e)(1) was lifted by the U.S. Court of Appeals for the District of Columbia, the number of years specified in the 1978 lead standard and subsequent amendments for compliance with the PEL of 50 ug/m(3) for exposure to airborne concentrations of lead levels for the particular industry.

Footnote(2) Large nonferrous foundries (20 or more employees) are required to achieve the PEL of 50 ug/m(3) by means of engineering and work practice controls. Small nonferrous foundries (fewer than 20 employees) are required to achieve an 8-hour TWA of 75 ug/m(3) by such controls.

Footnote(3) Expressed as the number of years from the date on which the Court lifts the stay on the implementation of paragraph (e)(1) for this industry for employers to achieve a lead in air concentration of 75 ug/m(3). Compliance with paragraph (e) in this industry is determined by a complance directive that incorporates elements from the settlement agreement between OSHA and representatives of the injury. are required to comply within five years.

1910.1025(e)(2)

Respiratory protection. Where engineering and work practice controls do not reduce employee exposure to or below the 50 ug/m(3) permissible exposure limit, the employer shall supplement these controls with respirators in accordance with paragraph (f).

1910.1025(e)(3)

Compliance program.

1910.1025(e)(3)(i)

Each employer shall establish and implement a written compliance program to reduce exposures to or below the permissible exposure limit, and interim levels if applicable, solely by means of engineering and work practice controls in accordance with the implementation schedule in paragraph (e)(1).

1910.1025(e)(3)(ii)

Written plans for these compliance programs shall include at least the following:

1910.1025(e)(3)(ii)(A)

A description of each operation in which lead is emitted; e.g. machinery used, material processed, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices;

1910.1025(e)(3)(ii)(B)

A description of the specific means that will be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure to lead;

1910.1025(e)(3)(ii)(C)

A report of the technology considered in meeting the permissible exposure limit;

1910.1025(e)(3)(ii)(D)

Air monitoring data which documents the source of lead emissions;

1910.1025(e)(3)(ii)(E)

A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.;

1910.1025(e)(3)(ii)(F)

A work practice program which includes items required under paragraphs (g), (h) and (i) of this regulation;

1910.1025(e)(3)(ii)(G)

An administrative control schedule required by paragraph (e)(6), if applicable;

1910.1025(e)(3)(ii)(H)

Other relevant information.

1910.1025(e)(3)(iii)

Written programs shall be submitted upon request to the Assistant Secretary and the Director, and shall be available at the worksite for examination and copying by the

Assistant Secretary, Director, any affected employee or authorized employee representatives.

1910.1025(e)(3)(iv)

Written programs must be revised and updated at least annually to reflect the current status of the program.

1910.1025(e)(4)

Mechanical ventilation.

1910.1025(e)(4)(i)

When ventilation is used to control exposure, measurements which demonstrate the effectiveness of the system in controlling exposure, such as capture velocity, duct velocity, or static pressure shall be made at least every 3 months. Measurements of the system's effectiveness in controlling exposure shall be made within 5 days of any change in production, process, or control which might result in a change in employee exposure to lead.

1910.1025(e)(4)(ii)

Recirculation of air. If air from exhaust ventilation is recirculated into the workplace, the employer shall assure that (A) the system has a high efficiency filter with reliable back-up filter; and (B) controls to monitor the concentration of lead in the return air and to bypass the recirculation system automatically if it fails are installed, operating, and maintained.

1910.1025(e)(5)

Administrative controls. If administrative controls are used as a means of reducing employees TWA exposure to lead, the employer shall establish and implement a job rotation schedule which includes:

1910.1025(e)(5)(i)

Name or identification number of each affected employee;

1910.1025(e)(5)(ii)

Duration and exposure levels at each job or work station where each affected employee is located; and

1910.1025(e)(5)(iii)

Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead.

1910.1025(f)

Respiratory protection.

1910.1025(f)(1)

General. For employees who use respirators required by this section, the employer must provide respirators that comply with the requirements of this paragraph. Respirators must be used during:

1910.1025(f)(1)(i)

Periods necessary to install or implement engineering or work-practice controls.

1910.1025(f)(1)(ii)

Work operations for which engineering and work-practice controls are not sufficient to reduce employee exposures to or below the permissible exposure limit.

1910.1025(f)(1)(iii)

Periods when an employee requests a respirator.

1910.1025(f)(2)

Respirator program.

1910.1025(f)(2)(i)

The employer must implement a respiratory protection program in accordance with 29 CFR 1910.134 (b) through (d) (except (d)(1)(iii)), and (f) through (m).

1910.1025(f)(2)(ii)

If an employee has breathing difficulty during fit testing or respirator use, the employer must provide the employee with a medical examination in accordance with paragraph (j)(3)(i)(C) of this section to determine whether or not the employee can use a respirator while performing the required duty.

1910.1025(f)(3)

Respirator selection.

1910.1025(f)(3)(i)

Employers must:

1910.1025(f)(3)(i)(A)

Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.

1910.1025(f)(3)(i)(B)

Provide employees with full facepiece respirators instead of half mask respirators for protection against lead aerosols that cause eye or skin irritation at the use concentrations.

1910.1025(f)(3)(i)(C)

Provide HEPA filters for powered and non-powered air-purifying respirators.

1910.1025(f)(3)(ii)

Employers must provide employees with a powered air-purifying respirator (PAPR) instead of a negative pressure respirator selected according to paragraph (f)(3)(i) of this standard when an employee chooses to use a PAPR and it provides adequate protection to the employee as specified by paragraph (f)(3)(i) of this standard.

1910.1025(g)

Protective work clothing and equipment -

1910.1025(g)(1)

Provision and use. If an employee is exposed to lead above the PEL, without regard to the use of respirators or where the possibility of skin or eye irritation exists, the employer shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

1910.1025(g)(1)(i)

Coveralls or similar full-body work clothing;

1910.1025(g)(1)(ii)

Gloves, hats, and shoes or disposable shoe coverlets; and

1910.1025(g)(1)(iii)

Face shields, vented goggles, or other appropriate protective equipment which complies with 1910.133 of this Part.

1910.1025(g)(2)

Cleaning and replacement.

1910.1025(g)(2)(i)

The employer shall provide the protective clothing required in paragraph (g)(1) of this section in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 ug/m(3) of lead as an 8-hour TWA.

1910.1025(g)(2)(ii)

The employer shall provide for the cleaning, laundering, or disposal of protective clothing and equipment required by paragraph (g)(1) of this section.

1910.1025(g)(2)(iii)

The employer shall repair or replace required protective clothing and equipment as needed to maintain their effectiveness.

1910.1025(g)(2)(iv)

The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms provided for that purpose as prescribed in paragraph (i)(2) of this section.

1910.1025(g)(2)(v)

The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change-room which prevents dispersion of lead outside the container.

1910.1025(g)(2)(vi)

The employer shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

1910.1025(g)(2)(vii)

The employer shall assure that the containers of contaminated protective clothing and equipment required by paragraph (g)(2)(v) are labeled as follows: CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.

1910.1025(g)(2)(viii)

The employer shall prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.

1910.1025(h)
Housekeeping -
1910.1025(h)(1)
Surfaces. All surfaces shall be maintained as free as practicable of accumulations of lead.
1910.1025(h)(2)
Cleaning floors.
1910.1025(h)(2)(i)
Floors and other surfaces where lead accumulates may not be cleaned by the use of compressed air.
1910.1025(h)(2)(ii)
Shoveling, dry or wet sweeping, and brushing may be used only where vacuuming or other equally effective methods have been tried and found not to be effective.
1910.1025(h)(3)
Vacuuming. Where vacuuming methods are selected, the vacuums shall be used and emptied in a manner which minimizes the reentry of lead into the workplace.
1910.1025(i)
Hygiene facilities and practices.
1910.1025(i)(1)
The employer shall assure that in areas where employees are exposed to lead above the PEL, without regard to the use of respirators, food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in change rooms, lunchrooms, and showers required under paragraphs (i)(2) - through (i)(4) of this section.
1910.1025(i)(2)
Change rooms.
1910.1025(i)(2)(i)
The employer shall provide clean change rooms for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.
1910.1025(i)(2)(ii)
The employer shall assure that change rooms are equipped with separate storage facilities for protective work clothing and equipment and for street clothes which prevent cross-contamination.
1910.1025(i)(3)
Showers.
1910.1025(i)(3)(i)
The employer shall assure that employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators, shower at the end of the work shift.
1910.1025(i)(3)(ii)
The employer shall provide shower facilities in accordance with 1910.141 (d)(3) of this part.
1910.1025(i)(3)(iii)
The employer shall assure that employees who are required to shower pursuant to paragraph (i)(3)(i) do not leave the workplace wearing any clothing or equipment worn during the work shift.
1910.1025(i)(4)
Lunchrooms.
1910.1025(i)(4)(i)
The employer shall provide lunchroom facilities for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.
1910.1025(i)(4)(ii)
The employer shall assure that lunchroom facilities have a temperature controlled, positive pressure, filtered air supply, and are readily accessible to employees.
1910.1025(i)(4)(iii)
The employer shall assure that employees who work in areas where their airborne exposure to lead is above the PEL without regard to the use of a respirator wash their hands and face prior to eating, drinking, smoking or applying cosmetics.
1910.1025(i)(4)(iv)
The employer shall assure that employees do not enter lunchroom facilities with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, down draft booth, or other cleaning method.

1910.1025(i)(5)
Lavatories. The employer shall provide an adequate number of lavatory facilities which comply with 1910.141(d)(1) and (2) of this part.
1910.1025(j)
Medical surveillance -
1910.1025(j)(1)
General.
1910.1025(j)(1)(i)
The employer shall institute a medical surveillance program for all employees who are or may be exposed above the action level for more than 30 days per year.
1910.1025(j)(1)(ii)
The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician.
1910.1025(j)(1)(iii)
The employer shall provide the required medical surveillance including multiple physician review under paragraph (j)(3)(iii) without cost to employees and at a reasonable time and place.
1910.1025(j)(2)
Biological monitoring -
1910.1025(j)(2)(i)
Blood lead and ZPP level sampling and analysis. The employer shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee covered under paragraph (j)(1)(i) of this section on the following schedule:
1910.1025(j)(2)(i)(A)
At least every 6 months to each employee covered under paragraph (j)(1)(i) of this section;
1910.1025(j)(2)(i)(B)
At least every two months for each employee whose last blood sampling and analysis indicated a blood lead level at or above 40 ug/100 g of whole blood. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 ug/100 g of whole blood; and
1910.1025(j)(2)(i)(C)
At least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.
1910.1025(j)(2)(ii)
Follow-up blood sampling tests. Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal under paragraph (k)(1)(i)(A), of this section, the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.
1910.1025(j)(2)(iii)
Accuracy of blood lead level sampling and analysis. Blood lead level sampling and analysis provided pursuant to this section shall have an accuracy (to a confidence level of 95 percent) within plus or minus 15 percent or 6 ug/100 ml, whichever is greater, and shall be conducted by a laboratory licensed by the Center for Disease Control, United States Department of Health, Education and Welfare (CDC) or which has received a satisfactory grade in blood lead proficiency testing from CDC in the prior twelve months.
1910.1025(j)(2)(iv)
Employee notification. Within five working days after the receipt of biological monitoring results, the employer shall notify in writing each employee whose blood lead level exceeds 40 ug/100 g:
1910.1025(j)(2)(iv)(A)
of that employee's blood lead level and (B) that the standard requires temporary medical removal with Medical Removal Protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal under paragraph (k)(1)(i) of this section.
1910.1025(j)(3)
Medical examinations and consultations -
1910.1025(j)(3)(i)

Frequency. The employer shall make available medical examinations and consultations to each employee covered under paragraph (j)(1)(i) of this section on the following schedule:

1910.1025(j)(3)(i)(A)

At least annually for each employee for whom a blood sampling test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 ug/100 g;

1910.1025(j)(3)(i)(B)

Prior to assignment for each employee being assigned for the first time to an area in which airborne concentrations of lead are at or above the action level;

1910.1025(j)(3)(i)(C)

As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use; and

1910.1025(j)(3)(i)(D)

As medically appropriate for each employee either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination.

1910.1025(j)(3)(ii)

Content. Medical examinations made available pursuant to paragraph (j)(3)(i)(A)-(B) of this section shall include the following elements:

1910.1025(j)(3)(ii)(A)

A detailed work history and a medical history, with particular attention to past lead exposure (occupational and non-occupational), personal habits (smoking, hygiene), and past gastrointestinal, hematologic,renal, cardiovascular, reproductive and neurological problems;

1910.1025(j)(3)(ii)(B)

A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be evaluated if respiratory protection will be used;

1910.1025(j)(3)(ii)(C)

A blood pressure measurement;

1910.1025(j)(3)(ii)(D)

A blood sample and analysis which determines:

1910.1025(j)(3)(ii)(D)(1)

Blood lead level;

1910.1025(j)(3)(ii)(D)(2)

Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology;

1910.1025(j)(3)(ii)(D)(3)

Zinc protoporphyrin;

1910.1025(j)(3)(ii)(D)(4)

Blood urea nitrogen; and,

1910.1025(j)(3)(ii)(D)(5)

Serum creatinine;

1910.1025(j)(3)(ii)(E)

A routine urinalysis with microscopic examination; and

1910.1025(j)(3)(ii)(F)

Any laboratory or other test which the examining physician deems necessary by sound medical practice. The content of medical examinations made available pursuant to paragraph (j)(3)(i)(C) - (D) of this section shall be determined by an examining physician and, if requested by an employee, shall include pregnancy testing or laboratory evaluation of male fertility.

1910.1025(j)(3)(iii)

Multiple physician review mechanism.

1910.1025(j)(3)(iii)(A)

If the employer selects the initial physician who conducts any medical examination or consultation provided to an employee under this section, the employee may designate a second physician:

1910.1025(j)(3)(iii)(A)(1)

To review any findings, determinations or recommendations of the initial physician; and

1910.1025(j)(3)(iii)(A)(2)

To conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

1910.1025(j)(3)(iii)(B)

The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen (15) days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

1910.1025(j)(3)(iii)(B)(1)

The employee informing the employer that he or she intends to seek a second medical opinion, and

1910.1025(j)(3)(iii)(B)(2)

The employee initiating steps to make an appointment with a second physician.

1910.1025(j)(3)(iii)(C)

If the findings, determinations or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

1910.1025(j)(3)(iii)(D)

If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee through their respective physicians shall designate a third physician:

1910.1025(j)(3)(iii)(D)(1)

To review any findings, determinations or recommendations of the prior physicians; and

1910.1025(j)(3)(iii)(D)(2)

To conduct such examinations, consultations, laboratory tests and discussions with the prior physicians as the third physician deems necessary to resolve the disagreement of the prior physicians.

1910.1025(j)(3)(iii)(E)

The employer shall act consistent with the findings, determinations and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

1910.1025(j)(3)(iv)

Information provided to examining and consulting physicians.

1910.1025(j)(3)(iv)(A)

The employer shall provide an initial physician conducting a medical examination or consultation under this section with the following information:

1910.1025(j)(3)(iv)(A)(1)

A copy of this regulation for lead including all Appendices;

1910.1025(j)(3)(iv)(A)(2)

A description of the affected employee's duties as they relate to the employee's exposure;

1910.1025(j)(3)(iv)(A)(3)

The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);

1910.1025(j)(3)(iv)(A)(4)

A description of any personal protective equipment used or to be used;

1910.1025(j)(3)(iv)(A)(5)

Prior blood lead determinations; and

1910.1025(j)(3)(iv)(A)(6)

All prior written medical opinions concerning the employee in the employer's possession or control.

1910.1025(j)(3)(iv)(B)

The employer shall provide the foregoing information to a second or third physician conducting a medical examination or consultation under this section upon request either by the second or third physician, or by the employee.
1910.1025(j)(3)(v)
Written medical opinions.
1910.1025(j)(3)(v)(A)
The employer shall obtain and furnish the employee with a copy of a written medical opinion from each examining or consulting physician which contains the following information:
1910.1025(j)(3)(v)(A)(1)
The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead;
1910.1025(j)(3)(v)(A)(2)
Any recommended special protective measures to be provided to the employee, or limitations to be placed upon the employee's exposure to lead;
1910.1025(j)(3)(v)(A)(3)
Any recommended limitation upon the employee's use of respirators, including a determination of whether the employee can wear a powered air purifying respirator if a physician determines that the employee cannot wear a negative pressure respirator; and
1910.1025(j)(3)(v)(A)(4)
The results of the blood lead determinations.
1910.1025(j)(3)(v)(B)
The employer shall instruct each examining and consulting physician to:
1910.1025(j)(3)(v)(B)(1)
Not reveal either in the written opinion, or in any other means of communication with the employer, findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead; and
1910.1025(j)(3)(v)(B)(2)
Advise the employee of any medical condition, occupational or nonoccupational, which dictates further medical examination or treatment.
1910.1025(j)(3)(vi)
Alternate Physician Determination Mechanisms. The employer and an employee or authorized employee representative may agree upon the use of any expeditious alternate physician determination mechanism in lieu of the multiple physician review mechanism provided by this paragraph so long as the alternate mechanism otherwise satisfies the requirements contained in this paragraph.
1910.1025(j)(4)
Chelation.
1910.1025(j)(4)(i)
The employer shall assure that any person whom he retains, employs, supervises or controls does not engage in prophylactic chelation of any employee at any time.
1910.1025(j)(4)(ii)
If therapeutic or diagnostic chelation is to be performed by any person in paragraph (j)(4)(i), the employer shall assure that it be done under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring and that the employee is notified in writing prior to its occurrence.
1910.1025(k)
Medical Removal Protection -
1910.1025(k)(1)
Temporary medical removal and return of an employee -
1910.1025(k)(1)(i)
Temporary removal due to elevated blood lead levels -
1910.1025(k)(1)(i)(A)
The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 60 ug/100 g of whole blood; and,
1910.1025(k)(1)(i)(B)

The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that the average of the last three blood sampling tests conducted pursuant to this section (or the average of all blood sampling tests conducted over the previous six (6) months, whichever is longer) indicates that the employee's blood lead level is at or above 50 ug/100 g of whole blood; provided, however, that an employee need not be removed if the last blood sampling test indicates a blood lead level at or below 40 ug/100 g of whole blood.

1910.1025(k)(1)(ii)

Temporary removal due to a final medical determination.

1910.1025(k)(1)(ii)(A)

The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

1910.1025(k)(1)(ii)(B)

For the purposes of this section, the phrase "final medical determination" shall mean the outcome of the multiple physician review mechanism or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section.

1910.1025(k)(1)(ii)(C)

Where a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to lead, the employer shall implement and act consistent with the recommendation.

1910.1025(k)(1)(iii)

Return of the employee to former job status.

1910.1025(k)(1)(iii)(A)

The employer shall return an employee to his or her former job status:

1910.1025(k)(1)(iii)(A)(1)

For an employee removed due to a blood lead level at or above 60 ug/100 g, or due to an average blood lead level at or above 50 ug/100 g, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 40 ug/100 g of whole blood;

1910.1025(k)(1)(iii)(A)(2)

For an employee removed due to a final medical determination, when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

1910.1025(k)(1)(iii)(B)

For the purposes of this section, the requirement that an employer return an employee to his or her former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

1910.1025(k)(1)(iv)

Removal of other employee special protective measure or limitations. The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

1910.1025(k)(1)(v)

Employer options pending a final medical determination. Where the multiple physician review mechanism, or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section, has not yet resulted in a final medical determination with respect to an employee, the employer shall act as follows:

1910.1025(k)(1)(v)(A)

Removal. The employer may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

1910.1025(k)(1)(v)(B)

Return. The employer may return the employee to his or her former job status, end any special protective measures provided to the employee, and remove any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions. If -

1910.1025(k)(1)(v)(B)(1)

the initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician or

1910.1025(k)(1)(v)(B)(2)

The employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the employer shall await a final medical determination.

1910.1025(k)(2)

Medical removal protection benefits -

1910.1025(k)(2)(i)

Provision of medical removal protection benefits. The employer shall provide to an employee up to eighteen (18) months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to this section.

1910.1025(k)(2)(ii)

Definition of medical removal protection benefits. For the purposes of this section, the requirement that an employer provide medical removal protection benefits means that the employer shall maintain the earnings, seniority and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to lead or otherwise limited.

1910.1025(k)(2)(iii)

Follow-up medical surveillance during the period of employee removal or limitation. During the period of time that an employee is removed from normal exposure to lead or otherwise limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to this section.

1910.1025(k)(2)(iv)

Workers' compensation claims. If a removed employee files a claim for workers' compensation payments for a lead-related disability, then the employer shall continue to provide medical removal protection benefits pending disposition of the claim. To the extent that an award is made to the employee for earnings lost during the period of removal, the employer's medical removal protection obligation shall be reduced by such amount. The employer shall receive no credit for workers' compensation payments received by the employee for treatment related expenses.

1910.1025(k)(2)(v)

Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with another employer made possible by virtue of the employee's removal.

1910.1025(k)(2)(vi)

Employees whose blood lead levels do not adequately decline within 18 months of removal. The employer shall take the following measures with respect to any employee removed from exposure to lead due to an elevated blood lead level whose blood lead level has not declined within the past eighteen (18) months of removal so that the employee has been returned to his or her former job status:

1910.1025(k)(2)(vi)(A)

The employer shall make available to the employee a medical examination pursuant to this section to obtain a final medical determination with respect to the employee;

1910.1025(k)(2)(vi)(B)

The employer shall assure that the final medical determination obtained indicates whether or not the employee may be returned to his or her former job status, and if not, what steps should be taken to protect the employee's health;

1910.1025(k)(2)(vi)(C)

Where the final medical determination has not yet been obtained, or once obtained indicates that the employee may not yet be returned to his or her former job status, the employer shall continue to provide medical removal protection benefits to the employee until either the employee is returned to former job status, or a final medical determination is made that the employee is incapable of ever safely returning to his or her former job status.

1910.1025(k)(2)(vi)(D)

Where the employer acts pursuant to a final medical determination which permits the return of the employee to his or her former job status despite what would otherwise be an unacceptable blood lead level, later questions concerning removing the employee again shall be decided by a final medical determination. The employer need not automatically remove such an employee pursuant to the blood lead level removal criteria provided by this section.

1910.1025(k)(2)(vii)

Voluntary Removal or Restriction of An Employee. Where an employer, although not required by this section to do so, removes an employee from exposure to lead or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition, the employer shall provide medical removal protection benefits to the employee equal to that required by paragraph (k)(2)(i) of this section.

1910.1025(l)

Employee information and training -

1910.1025(l)(1)

Training program.

1910.1025(l)(1)(i)

Each employer who has a workplace in which there is a potential exposure to airborne lead at any level shall inform employees of the content of Appendices A and B of this regulation.

1910.1025(l)(1)(ii)

The employer shall institute a training program for and assure the participation of all employees who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritation exists.

1910.1025(l)(1)(iii)

The employer shall provide initial training by 180 days from the effective date for those employees covered by paragraph (l)(1)(ii) on the standard's effective date and prior to the time of initial job assignment for those employees subsequently covered by this paragraph.

1910.1025(l)(1)(iv)

The training program shall be repeated at least annually for each employee.

1910.1025(l)(1)(v)

The employer shall assure that each employee is informed of the following:

1910.1025(l)(1)(v)(A)

The content of this standard and its appendices;

1910.1025(l)(1)(v)(B)

The specific nature of the operations which could result in exposure to lead above the action level;

1910.1025(l)(1)(v)(C)

The purpose, proper selection, fitting, use, and limitations of respirators;

1910.1025(l)(1)(v)(D)

The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females);

1910.1025(l)(1)(v)(E)

The engineering controls and work practices associated with the employee's job assignment;

1910.1025(l)(1)(v)(F)

The contents of any compliance plan in effect; and

1910.1025(l)(1)(v)(G)

Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician;

1910.1025(l)(2)

Access to information and training materials.

1910.1025(l)(2)(i)

The employer shall make readily available to all affected employees a copy of this standard and its appendices.

1910.1025(l)(2)(ii)

The employer shall provide, upon request, all materials relating to the employee information and training program to the Assistant Secretary and the Director.

1910.1025(l)(2)(iii)

In addition to the information required by paragraph (l)(1)(v), the employer shall include as part of the training program, and shall distribute to employees, any materials pertaining to the Occupational Safety and Health Act, the regulations issued pursuant to that Act, and this lead standard, which are made available to the employer by the Assistant Secretary.

1910.1025(m)

Signs -

1910.1025(m)(1)

General.

1910.1025(m)(1)(i)

The employer may use signs required by other statutes, regulations or ordinances in addition to, or in combination with, signs required by this paragraph.

1910.1025(m)(1)(ii)

The employer shall assure that no statement appears on or near any sign required by this paragraph which contradicts or detracts from the meaning of the required sign.

1910.1025(m)(2)

Signs.

1910.1025(m)(2)(i)

The employer shall post the following warning signs in each work area where the PEL is exceeded:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

1910.1025(m)(2)(ii)

The employer shall assure that signs required by this paragraph are illuminated and cleaned as necessary so that the legend is readily visible.

1910.1025(n)

Recordkeeping -

1910.1025(n)(1)

Exposure monitoring.

1910.1025(n)(1)(i)

The employer shall establish and maintain an accurate record of all monitoring required in paragraph (d) of this section.

1910.1025(n)(1)(ii)

This record shall include:

1910.1025(n)(1)(ii)(A)

The date(s), number, duration, location and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;

1910.1025(n)(1)(ii)(B)

A description of the sampling and analytical methods used and evidence of their accuracy;

1910.1025(n)(1)(ii)(C)

The type of respiratory protective devices worn, if any;

1910.1025(n)(1)(ii)(D)

Name, social security number, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and

1910.1025(n)(1)(ii)(E)
The environmental variables that could affect the measurement of employee exposure.
1910.1025(n)(1)(iii)
The employer shall maintain these monitoring records for at least 40 years or for the duration of employment plus 20 years, whichever is longer.
1910.1025(n)(2)
Medical surveillance.
1910.1025(n)(2)(i)
The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by paragraph (j) of this section.
1910.1025(n)(2)(ii)
This record shall include:
1910.1025(n)(2)(ii)(A)
The name, social security number, and description of the duties of the employee;
1910.1025(n)(2)(ii)(B)
A copy of the physician's written opinions;
1910.1025(n)(2)(ii)(C)
Results of any airborne exposure monitoring done for that employee and the representative exposure levels supplied to the physician; and
1910.1025(n)(2)(ii)(D)
Any employee medical complaints related to exposure to lead.
1910.1025(n)(2)(iii)
The employer shall keep, or assure that the examining physician keeps, the following medical records:
1910.1025(n)(2)(iii)(A)
A copy of the medical examination results including medical and work history required under paragraph (j) of this section;
1910.1025(n)(2)(iii)(B)
A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information;
1910.1025(n)(2)(iii)(C)
A copy of the results of biological monitoring.
1910.1025(n)(2)(iv)
The employer shall maintain or assure that the physician maintains those medical records for at least 40 years, or for the duration of employment plus 20 years, whichever is longer.
1910.1025(n)(3)
Medical removals.
1910.1025(n)(3)(i)
The employer shall establish and maintain an accurate record for each employee removed from current exposure to lead pursuant to paragraph (k) of this section.
1910.1025(n)(3)(ii)
Each record shall include:
1910.1025(n)(3)(ii)(A)
The name and social security number of the employee;
1910.1025(n)(3)(ii)(B)
The date on each occasion that the employee was removed from current exposure to lead as well as the corresponding date on which the employee was returned to his or her former job status;
1910.1025(n)(3)(ii)(C)
A brief explanation of how each removal was or is being accomplished; and
1910.1025(n)(3)(ii)(D)
A statement with respect to each removal indicating whether or not the reason for the removal was an elevated blood lead level.
1910.1025(n)(3)(iii)
The employer shall maintain each medical removal record for at least the duration of an employee's employment.
1910.1025(n)(4)
Availability.
1910.1025(n)(4)(i)

The employer shall make available upon request all records required to be maintained by paragraph (n) of this section to the Assistant Secretary and the Director for examination and copying.

1910.1025(n)(4)(ii)

Environmental monitoring, medical removal, and medical records required by this paragraph shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with 29 CFR 1910.1020 (a)-(e) and (2)-(i). Medical removal records shall be provided in the same manner as environmental monitoring records.

1910.1025(n)(5)

Transfer of records.

1910.1025(n)(5)(i)

Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by paragraph (n) of this section.

1910.1025(n)(5)(ii)

Whenever the employer ceases to do business and there is no successor employer to receive and retain the records required to be maintained by this section for the prescribed period, these records shall be transmitted to the Director.

1910.1025(n)(5)(iii)

At the expiration of the retention period for the records required to be maintained by this section, the employer shall notify the Director at least 3 months prior to the disposal of such records and shall transmit those records to the Director if requested within the period.

1910.1025(n)(5)(iv)

The employer shall also comply with any additional requirements involving transfer of records set forth in 29 CFR 1910.1020(h).

1910.1025(o)

Observation of monitoring.

1910.1025(o)(1)

Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to lead conducted pursuant to paragraph (d) of this section.

1910.1025(o)(2)

Observation procedures.

1910.1025(o)(2)(i)

Whenever observation of the monitoring of employee exposure to lead requires entry into an area where the use of respirators, protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such respirators, clothing and such equipment, and shall require the observer to comply with all other applicable safety and health procedures.

1910.1025(o)(2)(ii)

Without interfering with the monitoring, observers shall be entitled to:

1910.1025(o)(2)(ii)(A)

Receive an explanation of the measurement procedures;

1910.1025(o)(2)(ii)(B)

Observe all steps related to the monitoring of lead performed at the place of exposure; and

1910.1025(o)(2)(ii)(C)

Record the results obtained or receive copies of the results when returned by the laboratory.

1910.1025(p)

Appendices. The information contained in the appendices to this section is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation.

[60 FR 52856, Oct. 11, 1995; 61 FR 5507, Feb. 13, 1996; 63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998; 70 FR 1142, Jan. 5, 2005; 71 FR 16672 and 16673, April 3, 2006; 71 FR 50189, August 24, 2006]

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
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FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
MANCHESTER ARMORY
MANCHESTER, CONNECTICUT

August 2006
PN: 39741509

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 211 of 1092

BEST AVAILABLE COPY

TABLE OF CONTENTS

Section **Page**

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

BEST AVAILABLE COPY

TABLE OF CONTENTS (Cont)

APPENDICES

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 213 of 1092

BEST AVAILABLE COPY

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area and drill shed was inadequate.	Increase illumination through use of task lighting. (ANSI / IESNA RP-1-04)	RAC 4
Fire Safety		
Unmarked fire extinguishers were observed throughout the facility.	Portable fire extinguishers must be mounted, located and identified so that they are readily accessible to employees without subjecting the employees to possible injury (OSHA 29 CFR 1910.157(c)(1))	RAC 4
Lead		
Lead was detected in wipe samples collected in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 3
Peeling lead-based paint was present in the closet of room 202 and Room 116.	Personnel trained in accordance with the OSHA Lead Standard should stabilize peeling lead paint (OSHA 29 CFR 1910.1025 (h)(1))	RAC 3
Hazard Communication		
A site specific hazard communication plan was not available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 214 of 1092

BEST AVAILABLE COPY

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Manchester Armory located at 330 Main Street in Manchester, Connecticut 06040. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On July 18, 2005, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Manchester, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Mr. Non-Responsive site contact for this survey.

This armory is a four-story brick building, with an attached drill hall, that is constructed primarily of brick and mortar. The building was constructed in 1923. The building also houses the armorer in a fourth floor apartment. There are both state and federal employees located at the site. A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

Building maintenance is the responsibility of the State of Connecticut.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 215 of 1092

BEST AVAILABLE COPY

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. This is particularly true for part time employees. If more than one person is using a workstation, then proper adjustments need to be made to accommodate each person. No complaints were given to URS concerning workstations at the time of this survey.

General safety issues included unmarked fire extinguishers in the first level corridor and poor housekeeping in storage room 102.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the drill hall and outside. These readings were all made using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey was measured at 40.1% throughout the various building areas. The reading was below the recommended maximum of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations was measured at 469 parts per million (ppm). The outside reading was 358 ppm.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 216 of 1092

BEST AVAILABLE COPY

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 358 ppm on the day of the survey, the ASHRAE limit would be 1,058 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations remained below detectable limits on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 217 of 1092

BEST AVAILABLE COPY

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI / IESNA RP–1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (foot candles)	Recommended Lighting (foot candles)
Room 207	Administrative	47	50
Room 207 (work station #2)	Administrative	56	50
2nd Floor Corridor	Administrative	26	50
Classroom 208	Administrative	69	50
Room 206	Administrative	96	50
Room 202	Administrative	47	50
Room 204	Administrative	36	50
Lounge	Lounge	43	30
Room 104	Administrative	32	50
3rd Floor Conference Room	Administrative	85	50

With the exception of a few offices the lighting throughout the facility was generally inadequate.

2.2.5 Lead

Paint chips were collected in five areas where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. Two of the samples were found to contain lead in a concentration above the allowable limits of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the lead paint testing.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 218 of 1092

Table 2-2
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Room 202 Closet - Blue	Paint Chip #1	0.01	1.0
Room 104 Floor – Gray	Paint Chip #2	0.01	0.24
Room 102 Floor – Red	Paint Chip #3	0.01	0.36
Room 116 Ceiling – White	Paint Chip #4	0.01	0.11
Room 116 Wall - Green	Paint Chip #5	0.01	8.9

The analytical report from AMA is contained in Appendix D.

Wipe testing for lead was conducted in the administrative area using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 2-3 below shows the results of the lead sampling.

Table 2-3
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
2nd Floor Corridor - Floor	Wipe-09	0.108	<14	200
Room 301 – Window Sill	Wipe-10	0.108	1600	200
Room 116 – Floor	Wipe-12	0.108	640	200
Room 107 – Locker Top	Wipe-13	0.108	34	200
Room 207 – Window Sill	Wipe-15	0.108	<14	200
3rd Floor Balcony – Floor	Wipe-16	0.108	300	200
Room 102 – Floor	Wipe-17	0.108	1300	200
Room 204 - Bookshelf	Wipe-18	0.108	<14	200
Blank	Wipe-06	N/A	< 1.5 µg	N/A

2.2.6 Asbestos

Bulk samples of suspect asbestos containing materials (ACM) were collected by Mr. Todd Young for a determination of asbestos content. These materials included sheet flooring in room 303. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 219 of 1092

BEST AVAILABLE COPY

(PLM/DS)(EPA-600/M4-82-020, EPA-600/R-93-116). Table 2-4 below presents the results of the sample analysis.

Table 2-4
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Room 303	Sheet Flooring	ACM-01A	NAD
Room 303	Sheet Flooring	ACM-01B	NAD

NAD: No Asbestos Detected

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)).

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. Several fire exits and extinguishers were not marked or easily accessible. Several fire extinguishers were not marked on the first level and housekeeping was an issue in room 102.

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate throughout the facility. URS recommends increasing the area lighting or

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 220 of 1092

supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: Dust wipe samples collected from the administration areas were found to contain lead above 200 micrograms/ square foot ($\mu g/ft^2$) in room 303 (window sill, Room 116 (floor), 3rd Floor Balcony (floor) and Room 102 (floor). The 200 $\mu g/ft^2$ is the level recommended by the NGB Region North Industrial Hygiene office (appendix G). Areas exceeding 200 $\mu g/ft^2$ should be cleaned by personnel trained in accordance with the OSHA lead standard (29 CFR 1910.1025 and 29 CFR 1926.62) using approved methods.

Peeling blue wall paint in the closet of room 202 and peeling green wall paint in room 116 were determined through analytical testing to be lead-based. Removal of lead-based paint is not required under current OSHA and EPA regulations, however, precautions must be taken to prevent lead dust from becoming airborne. Precautions include engineering controls such as the use of wet methods and HEPA-filtered vacuums, training per OSHA lead standard (29 CFR 1910.1025 and 1926.62) and personal protective equipment.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 221 of 1092

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3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The former indoor firing range was decommissioned in the 1980's and has since been converted into the mess hall and offices. The former indoor firing range consists of rooms 108, 109, 110,111,112,113,114 and the kitchen.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

One air sample for lead dust was collected in the former firing range. Table 3-1 below shows the result of this air sample.

Table 3-1
Level of Airborne Lead in the Former Indoor Firing Range

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL ($\mu g/m^3$)
Former Firing Range (Mess Hall)	Pb-01	374	<8.0	50.0
Blank	Pb-03	N/A	<3 µg	N/A

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below the analytical limit of detection and therefore below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

Wipe testing for lead was conducted in the former firing range using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-2 below shows the results of the lead sampling.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 222 of 1092

BEST AVAILABLE COPY

Table 3-2
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Room 114 – Window Sill	Wipe-07	0.108	31	200
Kitchen Office - Floor	Wipe-08	0.108	46	200
Kitchen - Floor	Wipe-11	0.108	39	200
Room 114 - Floor	Wipe-14	0.108	<14	200
Room 114 - Locker Top	Wipe-19	0.108	40	200
Blank	Wipe-06	N/A	< 1.5 µg	N/A

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Wipe samples collected from the former indoor firing range for lead were found to be below 200 micrograms/square foot ($\mu g/ft^2$). The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 223 of 1092

BEST AVAILABLE COPY

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a hard wood floor.

The drill hall had obstructed emergency exits. Bird droppings were also observed.

There are no regular activities in the drill hall that involve children.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lighting

Lighting in the drill hall was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 4-1 below shows lighting measurements and the recommended lighting requirement (ANSI / IESNA RP–1-04 American National Standard Practice for Office Lighting).

Table 4-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (foot candles)	Recommended Lighting (foot candles)
Drill Hall	Assembly	13	30

Lighting in the drill hall was inadequate on the day of the survey.

4.2.2 Lead

One air sample for lead dust was also collected in the drill hall. Table 4-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 224 of 1092

BEST AVAILABLE COPY

Table 4-2
Level of Airborne Lead in the Drill Hall

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL ($\mu g/m^3$)
Drill Hall – Center	Pb-02	481	<6.2	50.0
Blank	Pb-03	N/A	3 µg	N/A

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below the analytical limit of detection and therefore below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-3 below shows the results of the lead sampling.

Table 4-3
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Southeast	Wipe-01	0.108	<14	200
Center	Wipe-02	0.108	<14	200
Southwest	Wipe-03	0.108	<14	200
Northwest	Wipe-04	0.108	<14	200
Northeast	Wipe-05	0.108	<14	200
Blank	Wipe-06	N/A	< 1.5 µg	N/A

Sample numbers and locations can be found on the site map in Appendix A.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 225 of 1092

BEST AVAILABLE COPY

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be below allowable limits and require no cleaning or further testing. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 226 of 1092

BEST AVAILABLE COPY

5.0 BOILER ROOM

The boiler room is maintained by State personnel. Federal employees do not work in the boiler room and therefore this area was not evaluated.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 227 of 1092

BEST AVAILABLE COPY

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was not found regarding hazard communication. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 228 of 1092

BEST AVAILABLE COPY

7.0 REFERENCES

American National Standards Institute

ANSI/IESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

Standard for Construction Industry: 29 CFR 1926

FOIA Requested Record #J-15-0085 (CT)
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Page 229 of 1092

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APPENDIX A

ARMORY DRAWING

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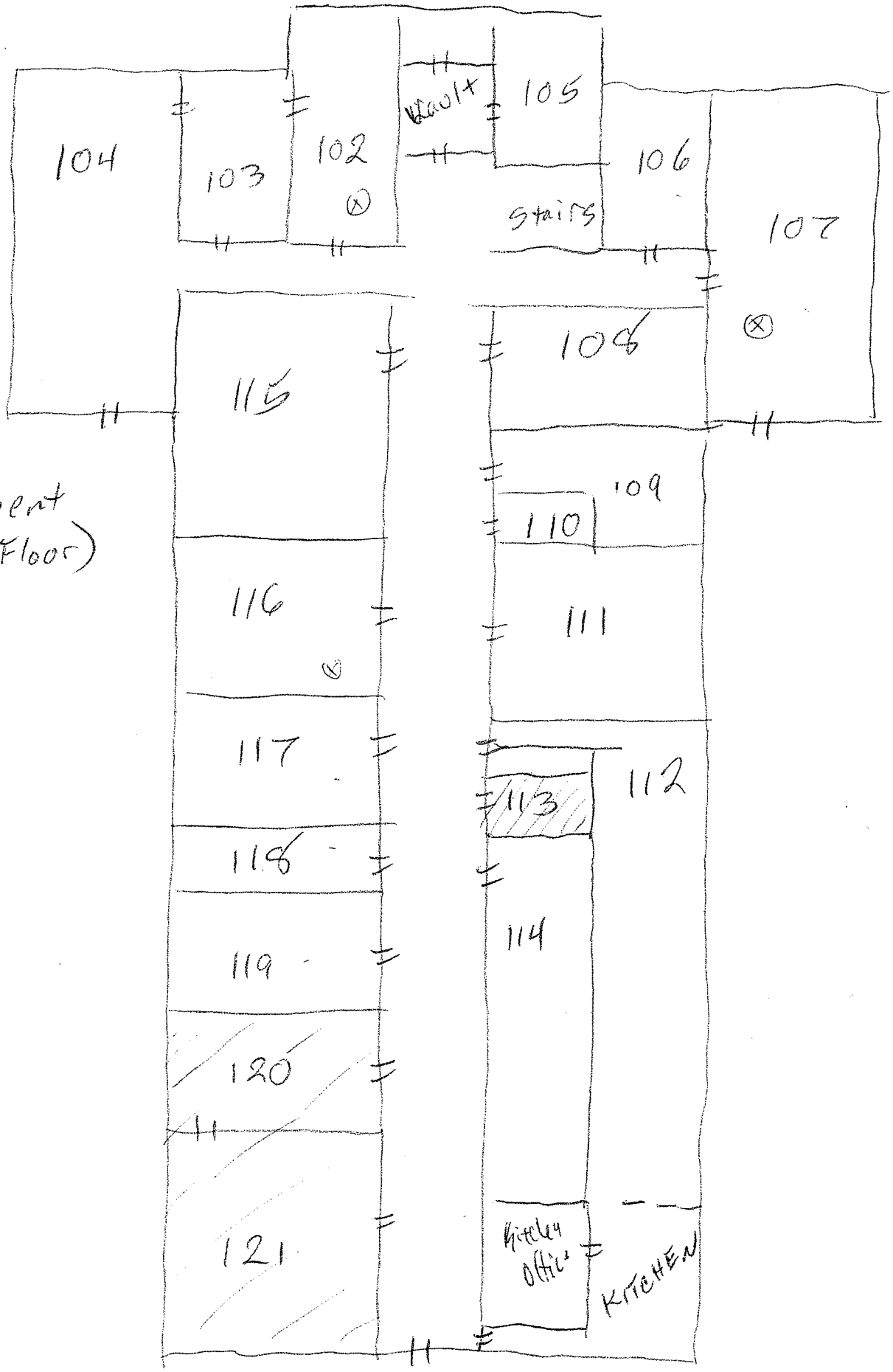
Main Street

N ←



Basement
(1st Floor)

MANCHESTER ARMORY

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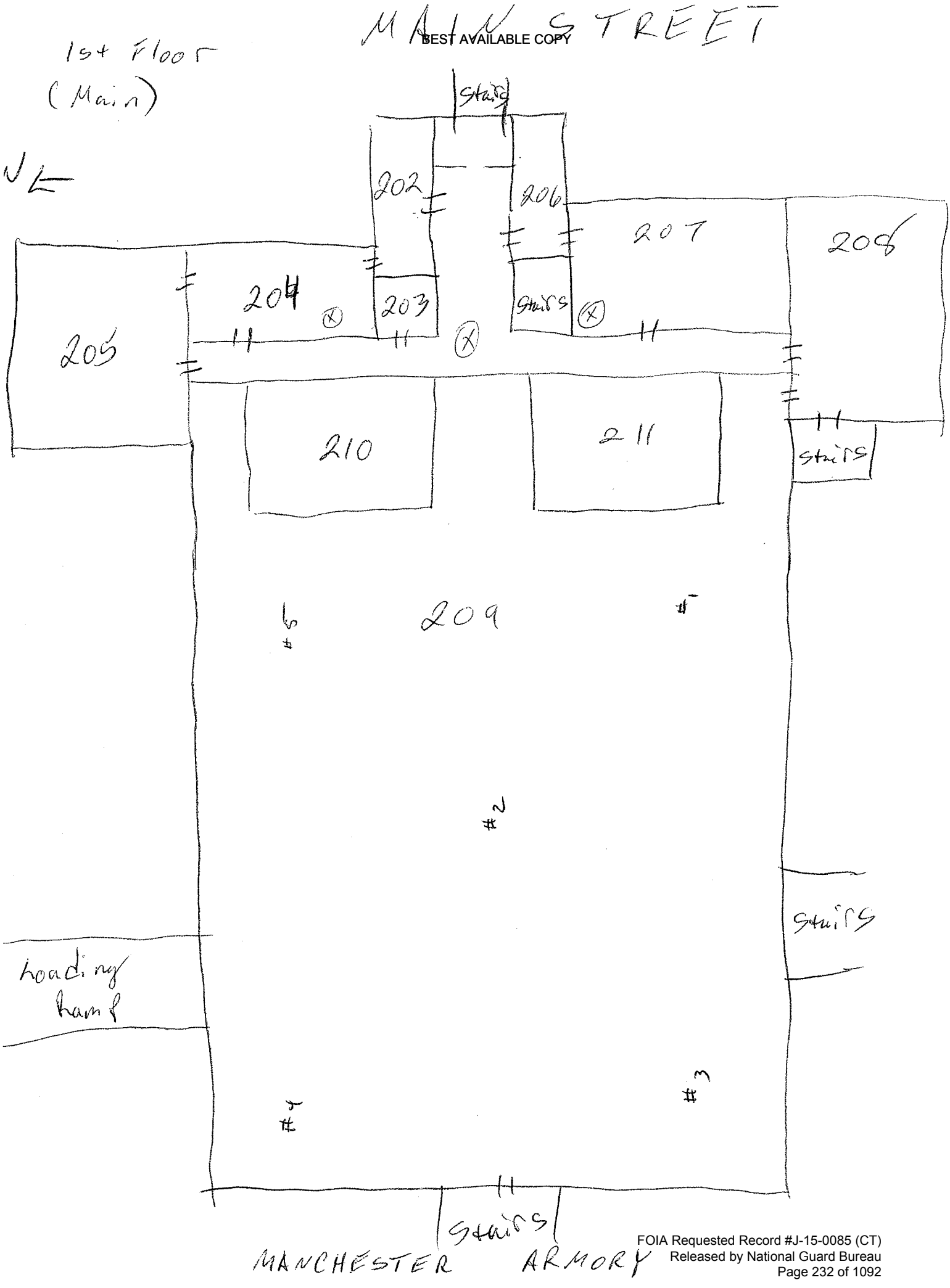

FOIA Requested Record #J-15-0085 (CT)
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Page 232 of 1092

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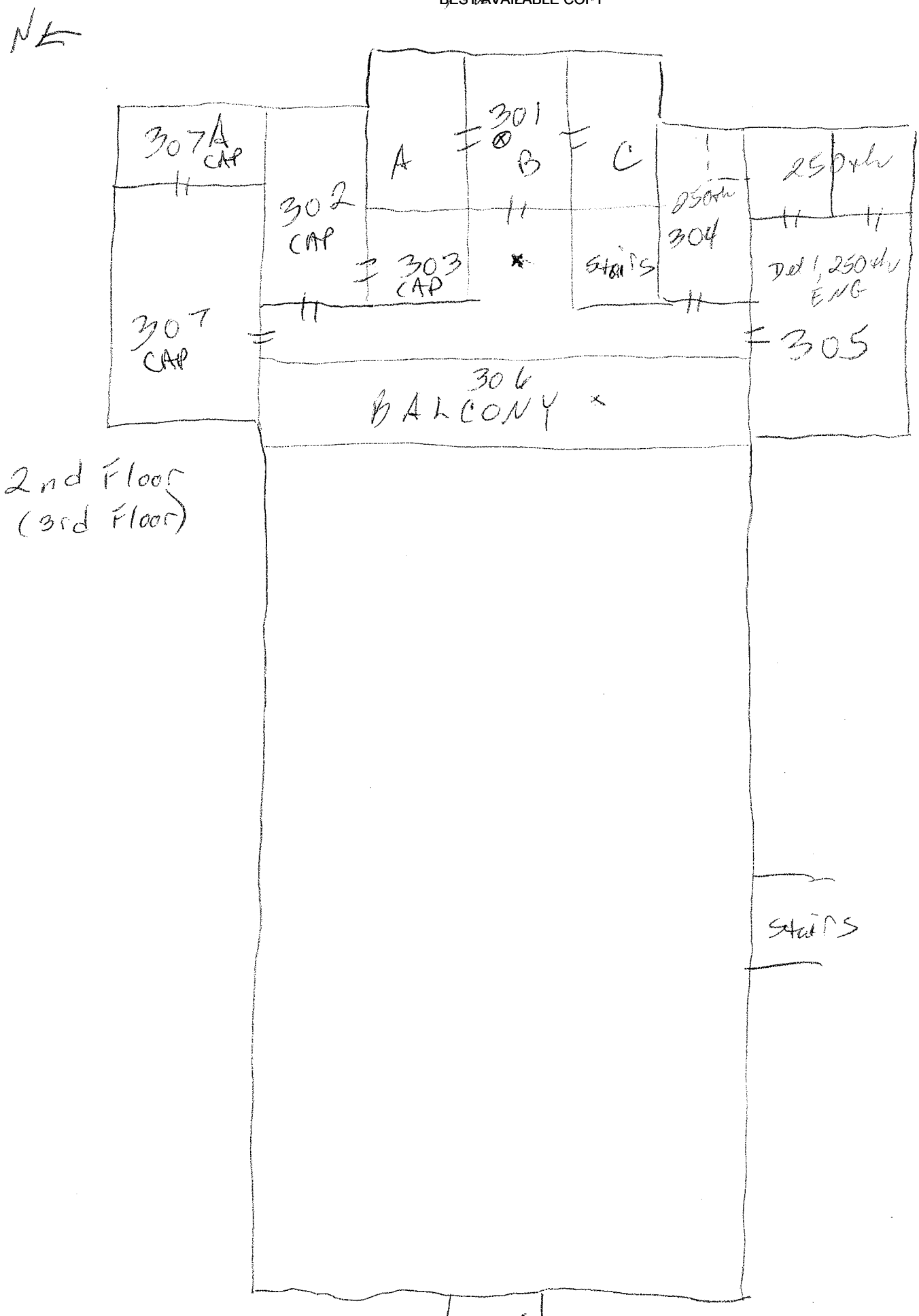

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Page 233 of 1092

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APPENDIX B

PERSONNEL LIST

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PERSONEL LIST
MANCHESTER ARMORY

Name	Rank
Non-Responsive	SFC
	SSG
	SSG
	SSG
	SGT
	SGT

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APPENDIX C

HAZARDOUS MATERIALS LIST

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HAZARDOUS MATERIAL INVENTORY LIST

Supply Annex

PG #

NSN	Nomenclature	Size	Quantity	MSDS #
Shelf 1				
8010-00-141-2950	Yellow 13655	1PT	1	30
8010-00-724-9743	Red 11105	1PT	1	30
8010-00-584-3148	Orange 12197	1PT	2	31
8010-00-290-6983	White 17875	1PT	7	32
8010-00-141-2951	Green 14062	1PT	1	34
8010-00-941-8712	Olive Drab 34058	1PT	4	35
8010-00-584-3149	Olive Green 14064	1PT	2	36
8010-00-721-9751	Silver 17178	1PT	3	37
8010-00-290-6984	Black 17038	1PT	2	38
8010-00-582-5382	Flat Black 37036	1PT	3	39
8010-00-721-9749	Blue 15080	1PT	5	33
8010-00-582-5936	Grey	1PT	2	40
8010-00-061-5454	Brown	1PT	5	
Shelf 2				
9110-263-9865	Fuel Compressed Trioxane MIL-F-10805C+Amend 1	4"x1" 6oz	117	4
8030-00-244-1031	Neats foot oil	1PT	8	
8030-00-244-1031	Neats foot oil	1BOX	1	
7930-00-724-9[illegible]	Rust upholstery cleaning compound	1ft	1	
	carb cleaner	1 pt	3	
8030-00-008-7198	Sealing Compound	1 pt	5	
6850-00-159-5297	Rain Repellent windshield	1pt	2	
9150-00-985-7244	Grease	tubs	3	
9150-00-261-7899	Penetrating oil	1PT	1	
8030-00-244-1031	Neats foot oil	1 qt	3	
9150-01-385-4995	Transmission fluid	1q t	5	
	motor oil	1q t	1	
	Steel wool	Pcs	3	
Shelf 3				
8030-00-664-4944	Canvas Preservative Coating	1Gal	2	42
0000771301	Blue Steel 7713-01 (Alkyd Urethane)	1 Gal	4	47
	Dark Brown PT	1Gal	1	
9110-00-263-9865	Compressed trioxane	Box	2	
8010-00-081-0809	Paint Semi Gloss low Grey PT	can	3	
		Gallon	1	
	Sheet Flooring Adhesive	can	4	
8030-00174-3201	Leather dressing	can	2	
	Propane	Bottle	1	

FOIA Requested Record #J-15-0085 (CT)
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Page 237 of 1092

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HAZARDOUS MATERIAL INVENTORY LIST

SP014

NSN	Nomenclature	Size	Quantity	MSDS #
Shelf 1				
6850-00-916-2814	Cleaning compound w/antifreeze	Single	2	
Shelf 2				
Shelf 3				

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Page 238 of 1092

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APPENDIX D

ANALYTICAL RESULTS

FOIA Requested Record #J-15-0085 (CT)
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Page 239 of 1092

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	ARNG	**Chain Of Custody:**	156806
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Manchester, CT	**Date Submitted:**	8/18/2006
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	8/21/2006

Report Date: 21-Aug-06

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0675932	Air 01	Flame	Air	374	N/A	8.02	ug/m³	<	8	ug/m³	
0675933	Air 02	Flame	Air	481	N/A	6.24	ug/m³	<	6.2	ug/m³	
0675934	Air 03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted]

Technical Manager: [redacted]

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 240 of 1092

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NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	ARNG	**Chain Of Custody:**	156805
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Manchester, CT	**Date Submitted:**	8/18/2006
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	8/18/2006

Report Date: 18-Aug-06

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0675927	Paint Chip #1	Flame	Paint Chip	****	N/A	0.01	%Pb	1	%Pb	
0675928	Paint Chip #2	Flame	Paint Chip	****	N/A	0.01	%Pb	0.24	%Pb	
0675929	Paint Chip #3	Flame	Paint Chip	****	N/A	0.01	%Pb	0.36	%Pb	
0675930	Paint Chip #4	Flame	Paint Chip	****	N/A	0.01	%Pb	0.11	%Pb	
0675931	Paint Chip #5	Flame	Paint Chip	****	N/A	0.01	%Pb	8.9	%Pb	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted]

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 241 of 1092

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AIHA 100470

Client:	National Guard Bureau	**Job Name:**	ARNG	**Chain Of Custody:**	156804
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Manchester, CT	**Date Analyzed:**	8/25/2006
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments
0675913	ACM-01A	NAD	--	--	--	--	--	--	3	--	--	97	Brown	Homogeneous	CK	
0675914	ACM-01B	NAD	--	--	--	--	--	--	TR	--	--	100	Brown	Homogeneous	CK	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

[redacted]

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Released by National Guard Bureau
Page 242 of 1092

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NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	ARNG	**Chain Of Custody:**	156807		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Manchester, CT	**Date Submitted:**	8/18/2006		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	Not Provided	**Date Analyzed:**	8/30/2006	**Report Date:**	30-Aug-06

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0675935	Wipe 01	Furnace	Wipe	****	0.108	13.94	ug/ft²	<	14	ug/ft²	
0675936	Wipe 02	Furnace	Wipe	****	0.108	13.94	ug/ft²	<	14	ug/ft²	
0675937	Wipe 03	Furnace	Wipe	****	0.108	13.94	ug/ft²	<	14	ug/ft²	
0675938	Wipe 04	Furnace	Wipe	****	0.108	13.94	ug/ft²	<	14	ug/ft²	
0675939	Wipe 05	Furnace	Wipe	****	0.108	13.94	ug/ft²	<	14	ug/ft²	
0675940	Wipe 06	Furnace	Wipe Blank	****	N/A	1.50	ug	<	1.5	ug	
0675941	Wipe 07	Furnace	Wipe	****	0.108	13.94	ug/ft²		31	ug/ft²	
0675942	Wipe 08	Furnace	Wipe	****	0.108	13.94	ug/ft²		46	ug/ft²	
0675943	Wipe 09	Furnace	Wipe	****	0.108	13.94	ug/ft²	<	14	ug/ft²	
0675944	Wipe 10	Flame	Wipe	****	0.108	111.52	ug/ft²		1600	ug/ft²	
0675945	Wipe 11	Furnace	Wipe	****	0.108	13.94	ug/ft²		39	ug/ft²	
0675946	Wipe 12	Furnace	Water	****	0.108	1.00	ug/L		640	ug/L	
0675947	Wipe 13	Furnace	Wipe	****	0.108	13.94	ug/ft²		34	ug/ft²	
0675948	Wipe 14	Furnace	Wipe	****	0.108	13.94	ug/ft²	<	14	ug/ft²	
0675949	Wipe 15	Furnace	Wipe	****	0.108	13.94	ug/ft²		17	ug/ft²	
0675950	Wipe 16	Flame	Wipe	****	0.108	111.52	ug/ft²		300	ug/ft²	
0675951	Wipe 17	Flame	Wipe	****	0.108	111.52	ug/ft²		1300	ug/ft²	
0675952	Wipe 18	Furnace	Wipe	****	0.108	13.94	ug/ft²	<	14	ug/ft²	
0675953	Wipe 19	Furnace	Wipe	****	0.108	13.94	ug/ft²		40	ug/ft²	

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FOIA Requested Record #J-15-0085 (CT)
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Page 243 of 1092

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	ARNG	**Chain Of Custody:**	156807		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Manchester, CT	**Date Submitted:**	8/18/2006		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	Not Provided	**Date Analyzed:**	8/30/2006	**Report Date:**	30-Aug-06

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted] Non-Responsive

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FOIA Requested Record #J-15-0085 (CT)
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Page 244 of 1092

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APPENDIX E

TRAINING CERTIFICATES

FOIA Requested Record #J-15-0085 (CT)
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INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted] Non-Responsive

has completed the requisite training, and has passed an examination for reaccreditation

Asbestos Project Monitor Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

February 4, 2005
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

February 04, 2005
Examination Date

0571711746151
Certificate Number

February 04, 2006
Expiration Date

[redacted] Non-Responsive

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APPENDIX F

PHOTOGRAPHS

FOIA Requested Record #J-15-0085 (CT)
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Photo 6836: Room 207 – Computer Work Station

Photo 6840: Room 206 – Typewriter work station

Photo 6844: Drill Shed

Photo 6850: Hall – Unidentified fire extinguisher

Photo 6858: Room 116 – Peeling lead-based paint

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 249 of 1092

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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, Connecticut 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
NAUGATUCK ARMORY
NAUGATUCK, CONNECTICUT

JULY 2006
PN: 39741509

Non-Responsive

Office Manager

Non-Responsive

Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 252 of 1092

BEST AVAILABLE COPY

TABLE OF CONTENTS

Section **Page**

APPENDICES

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 253 of 1092

BEST AVAILABLE COPY

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in about half of the office spaces.	Increase illumination through use of task lighting. (ANSI / IESNA RP-1-04)	RAC 4
Hazard Communication		
Material safety data sheets were not available on site	Employers shall have a material safety data sheet in the workplace for each hazardous chemical which they use (OSHA 29 CFR 1910.1200 (g)(1)).	RAC 4
A site specific hazard communication plan was not available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Lead		
Lead was detected in wipe samples collected from the drill hall and the administrative area in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean areas where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 3

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 254 of 1092

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Naugatuck Armory located at 619 Rubber Avenue in Naugatuck, Connecticut 06770. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On August 12, 2005, Ms. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Naugatuck, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Ms. Non-Responsive site contact for this survey.

This armory is a single-story brick building, with an attached drill hall, that is constructed primarily of brick and mortar. This facility is built on a concrete slab. A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 255 of 1092

BEST AVAILABLE COPY

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. This was particularly true for part time employees. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning workstations at the time of this survey.

Paints, thinners and other chemicals were located in the flammable storage lockers without hazard communication data.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the drill hall and outside. These readings were all measured using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey was measured at 58.1 % throughout the various building areas. This average reading was below the recommended level of 65.0% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations was measured at an average of 539 parts per million (ppm). The outside reading was 470 ppm.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 256 of 1092

BEST AVAILABLE COPY

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 470 ppm on the day of the survey, the ASHRAE limit would be 1,170 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 2 to 3 ppm on the day of the survey. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 257 of 1092

recommended lighting requirement (ANSI/IESNA RP-1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (foot candles)	Recommended Lighting (foot candles)
Drill Hall	Assembly	16	30
Room #1	Administrative	48	50
Room #2	Administrative	60	50
Room #3	Administrative	128	50
Room #4	Administrative	44	50
Room #6	Administrative	103	50
Room #9	Administrative	12	50
Room #16	Administrative	107	50
Room #17	Administrative	92	50

On the day of the survey, illumination in half of the administrative area was below recommended lighting levels.

2.2.5 Lead

Wipe testing for lead dust was conducted in the administration area using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 2-2 below shows the results of the lead sampling.

Table 2-2
Levels of Lead Dust Found in the Administration Area

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Room #2 Sill	RWS-01	10x10 cm	8.7	200
Room #16 Floor	RWS-02	10x10 cm	41	200
Room #11 Heater	RWS-03	10x10 cm	45	200
Room #8 Floor	RWS-04	10x10 cm	540	200

Sample numbers and locations can be found on the site map in Appendix A.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 258 of 1092

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in approximately 50% of the offices and generally throughout the facility. URS recommends increasing the area lighting or supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: A Dust wipe sample collected in room #8 was found to have a lead content above 200 micrograms/ square foot. This is the level recommended by the NGB Region North Industrial Hygiene Office (appendix G). The U.S. Occupational Safety and Health Administration (OSHA) regulations, 29 CFR 1910.1025 and 29 CFR 1926.62 are designed to protect workers potentially exposed to elevated airborne levels of lead from lead-based paint. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

HAZARD COMMUNICATION: Listed containers of paints and thinners were observed in the flammable locker without MSDS forms.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 259 of 1092

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3.0 FORMER INDOOR FIRING RANGE

This site has never had an indoor firing range.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 260 of 1092

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a hard wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall outside Room #5-Floor	DH-01	10x10 cm	46	200
Drill Hall outside Room #2-Electric Box	DH-02	10x10 cm	210	200
Drill Hall outside Room #17-Electric Box	DH-03	10x10 cm	73	200
Drill Hall Outside Room #9-Electric Box	DH-04	10x10 cm	130	200
Drill Hall Outside Room #7-Top of Safe	DH-05	10x10 cm	84	200

Sample numbers and locations can be found on the site map in Appendix A.

4.3 Ventilation System Evaluation

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 261 of 1092

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4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: A Dust wipe sample collected from the drill hall outside room #2 was above 200 micrograms/ square foot. This is the level recommended by the NGB Region North Industrial Hygiene Office (appendix G). The U.S. Occupational Safety and Health Administration (OSHA) regulations, 29 CFR 1910.1025 and 29 CFR 1926.62 are designed to protect workers potentially exposed to elevated airborne levels of lead from lead-based paint. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 262 of 1092

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5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

5.2.1 Asbestos

Asbestos-containing pipe insulation was observed to be in good condition in the boiler room.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

ASBESTOS: Asbestos-containing pipe insulation in the boiler room was observed to be in good condition

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 263 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was not found regarding hazard communication. Training records maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 264 of 1092

BEST AVAILABLE COPY

7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 265 of 1092

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APPENDIX A

ARMORY DRAWING

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 266 of 1092

NATIONAL GUARD ARMORY, NAUGATUCK, CONNECTICUT 06770

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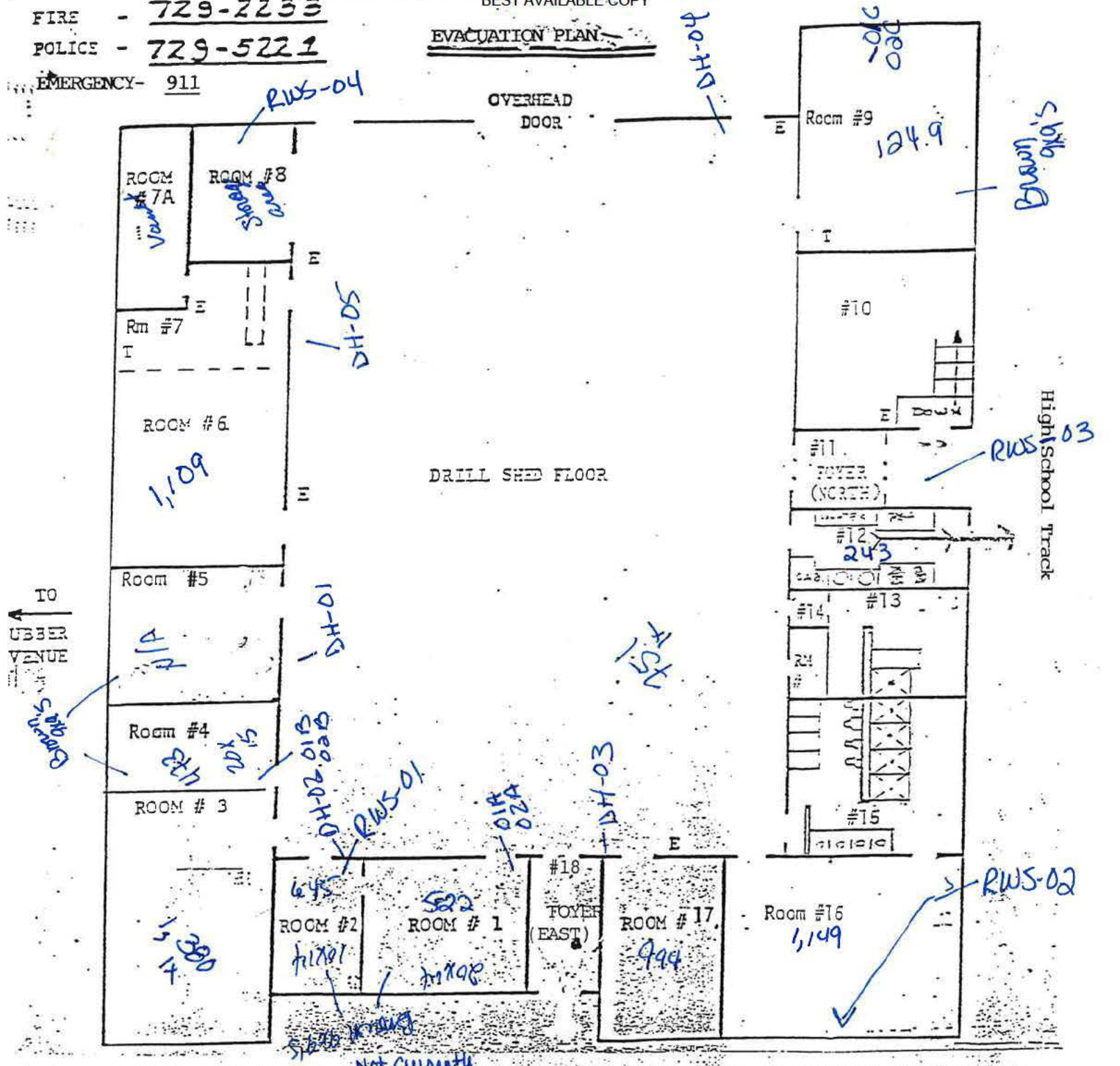
FIRE - 729-2233

POLICE - 729-5221

EMERGENCY- 911

EVACUATION PLAN



ROOM #1	Orderly Room	ROOM #8	Storage Area	ROOM #16	Locker Room
ROOM #2	1SGs Office	ROOM #9	Day Room	ROOM #17	Fitness Room
ROOM #3	Classroom	ROOM #10	Boiler Room	ROOM #18	Foyer East
ROOM #4	Cdr's Office	ROOM #11	Foyer North		
ROOM #5	Recruiters Office	ROOM #12	Kitchen		
ROOM #6	Supply Room	ROOM #13	Female Latrine		
ROOM #7	HQs Room	ROOM #14	Caretakers Room		
ROOM #7A	Arms Vault	ROOM #15	Men;s Room		

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 267 of 1092

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APPENDIX B

PERSONNEL LIST

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 268 of 1092

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PERSONEL LIST
NAUGATUCK ARMORY

Name	Rank
Non-Responsive	SFC
	SSG
	SSG
	SGT

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APPENDIX C

HAZARDOUS MATERIALS LIST

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Released by National Guard Bureau
Page 270 of 1092

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HAZARDOUS MATERIAL INVENTORY LIST

SHELF#	NOMENCLATURE	SIZE	QTY	MSDS#
1	PITT-TECH ACRYLIC PAINT 90-477	GALLON	4	1 01
1	PITT-TECH ACRYLIC PAINT 90-474	GALLON	1	1 02
1	PITTSBURGH SPEC-HIDE 6-253	GALLON	2	1 03
1			1	1 04
1	PITT-TECH ACRYLIC PAINT 90-453	GALLON	2	1 05
2	GREZ-OFF	1/2 GAL	12	2 01
2	KINGSFORD LIGHTER FLUID	1 PINT	1	2 02
2	HYDRAULIC FLUID	QUART	2	2 03
3	PITTSBURGH ENAMEL 6-544	5 GALLON	2	3 01 02
3	PITTSBURGH ENAMEL 6-515	5 GALLON	1	3 03

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APPENDIX D

ANALYTICAL RESULTS

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 272 of 1092

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau 6/1/10
Page 273 of 1092

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	Job Name:	Armory	Chain Of Custody:	147710
Address:	301-BH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	Job Location:	Naugertuck CT	Date Submitted:	1/16/2006
	Havre de Grace, Maryland 21078	Job Number:	Not Provided	Person Submitting:	[redacted]
		P.O. Number:	Not Provided	Date Analyzed:	1/19/2006

Report Date: 19-Jan-06

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0620349	RWS-01	Furnace	Wipe	****	0.108	2.79	ug/ft²	8.7	ug/ft²	
0620350	RWS-02	Furnace	Wipe	****	0.108	13.94	ug/ft²	41	ug/ft²	
0620351	RWS-03	Furnace	Wipe	****	0.108	13.94	ug/ft²	45	ug/ft²	
0620352	RWS-04	Furnace	Wipe	****	0.108	69.70	ug/ft²	540	ug/ft²	
0620353	DH-01	Furnace	Wipe	****	0.108	13.94	ug/ft²	46	ug/ft²	
0620354	DH-02	Furnace	Wipe	****	0.108	69.70	ug/ft²	210	ug/ft²	
0620355	DH-03	Furnace	Wipe	****	0.108	69.70	ug/ft²	73	ug/ft²	
0620356	DH-04	Furnace	Wipe	****	0.108	69.70	ug/ft²	130	ug/ft²	
0620357	DH-05	Furnace	Wipe	****	0.108	69.70	ug/ft²	84	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Technical Manager: [redacted]

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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APPENDIX E

TRAINING CERTIFICATES

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May-26-05 01:17pm From-URS CORPORATION BEST AVAILABLE COPY T-317 P.02/02 F-076

CERTIFICATE OF ACHIEVEMENT

This certifies that

[redacted] Non-Responsive

has successfully completed the

Asbestos Site Inspector Refresher Training
Asbestos Accreditation Under TSCA Title II
40 CFR Part 763

conducted by

ATC Associates Inc.
73 William Franks Drive
West Springfield, MA 0108
(413) 781-0070

[redacted] Non-Responsive

May 26, 2005
Date of Course

May 26, 2006
Expiration Date

[redacted] Non-Responsive

SIAR-1938
Certificate Number

May 26, 2005
Examination Date

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 275 of 1092

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APPENDIX F

PHOTOGRAPHS

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 276 of 1092

Photo 1:
Exterior

Photo 2:
Drill Hall-Layout

Photo 3:
Drill Hall-Flammable Cabinets

Photo 4:
Day Room-Damaged 9"x9" Floor Tiles

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Photo 5:
Boiler Room-Fiberglass Pipe Insulation and Fittings

Photo 6:
Room #3-Proper Chair, Unadjustable Keyboard

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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Industrial Hygiene Survey

Connecticut Army National Guard (CTARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Naugatuck Readiness Center
619 Rubber Avenue
Naugatuck, CT 06770

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: August 28, 2012

AEI Project #: J12-676 3h CT Naugatuck RC

_____

Non-Responsive, **CIH, CSP, LEED Green Associate**
Industrial Hygienist

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 282 of 1092

Table of Contents

List of Tables and Appendices

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 283 of 1092

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) Naugatuck Readiness Center located at 619 Rubber Avenue, Naugatuck, CT 06770. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 28, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for the three areas in the former firing range and one area in the Drill Hall. Surfaces contaminated with lead dust should be cleaned using wet methods or high efficiency particulate air (HEPA)-filtered vacuums.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged spline ceiling tile and mastic patties were observed in some areas, and bulk samples were collected. No asbestos was detected in either material sample.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of mold growth was observed on the day of the inspection; however, evidence of water intrusion was observed in the form of concrete efflorescence on three interior walls of the Drill Hall that have not been repointed and sealed on the exterior. One wall was reported to have been repointed and sealed and did not show signs of efflorescence.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 5 foot candles (fc) to 300 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly above the comfort ranges for the summer season on the day of the survey. The outdoor temperature and relative humidity were 82.5° F and 59.6% on the day of monitoring, and indoor conditions were similar to outdoor conditions. The facility has window air-conditioning units in some areas, but the majority of the building is not air-conditioned. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide were below the recommended concentrations in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available as per the Occupational Safety and Health

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 284 of 1092

Administration (OSHA) standard 29 CFR 1910.1200. MSDSs were readily available and up to date. It is recommended that the written hazard communication program be placed in every MSDS notebook along with any related training records.

Overall, the Naugatuck Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 285 of 1092

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) Naugatuck Readiness Center located at 619 Rubber Avenue, Naugatuck, CT 06770. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 28, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Naugatuck Readiness Center was built in the 1960's. The readiness center staff has been deployed and only the part time civilian caretaker (maintainer) is on staff at the moment. The operations normally conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Naugatuck Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Naugatuck facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state employed maintainer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 286 of 1092

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for damaged building materials that may contain asbestos or lead-based paint, for water damage or mold problems; for potential ergonomic problems; and for housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the state of Connecticut limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical Services, Inc. (AMA) of Lanham, MD for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Wipe samples collected from the facility were below the recommended maximum level for surface contamination in all areas sampled except for three areas in the former firing range and one area in the Drill Hall. Surfaces contaminated with lead dust should be cleaned using wet methods or high efficiency particulate air (HEPA)-filtered vacuums. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for CTARNG Naugatuck Readiness Center on August 28, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
Naug-W01	Arms room – floor (former firing range)	**9,900**
Naug-W02	Commo room – floor (former firing range)	**1,700**
Naug-W03	Supply room – floor (former firing range)	**470**
Naug-W04	Drill Hall – floor	<110
Naug-W05	Drill Hall – top of flammable storage cabinet	**310**
Naug-W06	Drill Hall – top of amnesty box	<110
Naug-W07	Drill Hall – floor under return grill	<110
Naug-W08	Drill Hall – floor near Fitness Center	<110
Naug-W09	Kitchen – table next to microwave	<110

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 287 of 1092

Table 1 – Results of Dust Wipe Sampling for CTARNG Naugatuck Readiness Center on August 28, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
Naug-W10	Classroom – floor (VCT)	<110
Naug-W11	Fitness Center – rubber floor	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft^2) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged spline ceiling tile and mastic patties were observed in a few offices and the main foyer, and bulk samples were collected. Samples were submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. No asbestos was detected in the ceiling tile or mastic patties.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of mold growth was observed on the day of the inspection; however, evidence of water intrusion was observed in the form of concrete efflorescence on three interior walls of the Drill Hall that have not been repointed and sealed on the exterior. One wall was reported to have been repointed and sealed and did not show signs of efflorescence.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas due to bulbs being removed or blown out. The illumination measurements indoors ranged from 5 foot candles (fc) to over 300 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 288 of 1092

the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 80.3 to 84.3° F and 53.4 to 71.0% Rh. Temperature and relative humidity measurements were mostly acceptable compared to the comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 82.5° F and 59.6%, and conditions inside were similar to the outdoor conditions. This readiness center has window air-conditioning units in some areas but the majority of the building is not air-conditioned.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 354 to 603 parts per million (ppm). The outdoor CO_2 concentration was 323 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.0 to 0.4 ppm; therefore all measurements were below the concentrations of concern.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available per OSHA 29 CFR 1910.1200. MSDSs were readily available and up to date. It is recommended that the written hazard communication program be placed in every MSDS notebook along with any related training records.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 289 of 1092

7 Conclusions

The results of the evaluation indicated a few minor concerns at the facility. Overall, the Naugatuck Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 290 of 1092

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10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 291 of 1092

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Appendix A
Building Layout

FOIA Requested Record #J-15-0085 (CT)
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NATIONAL GUARD ARMORY, NAUGATUCK, CONNECTICUT 06770

- 729-2233

E - 729-5221

GENCY- 911

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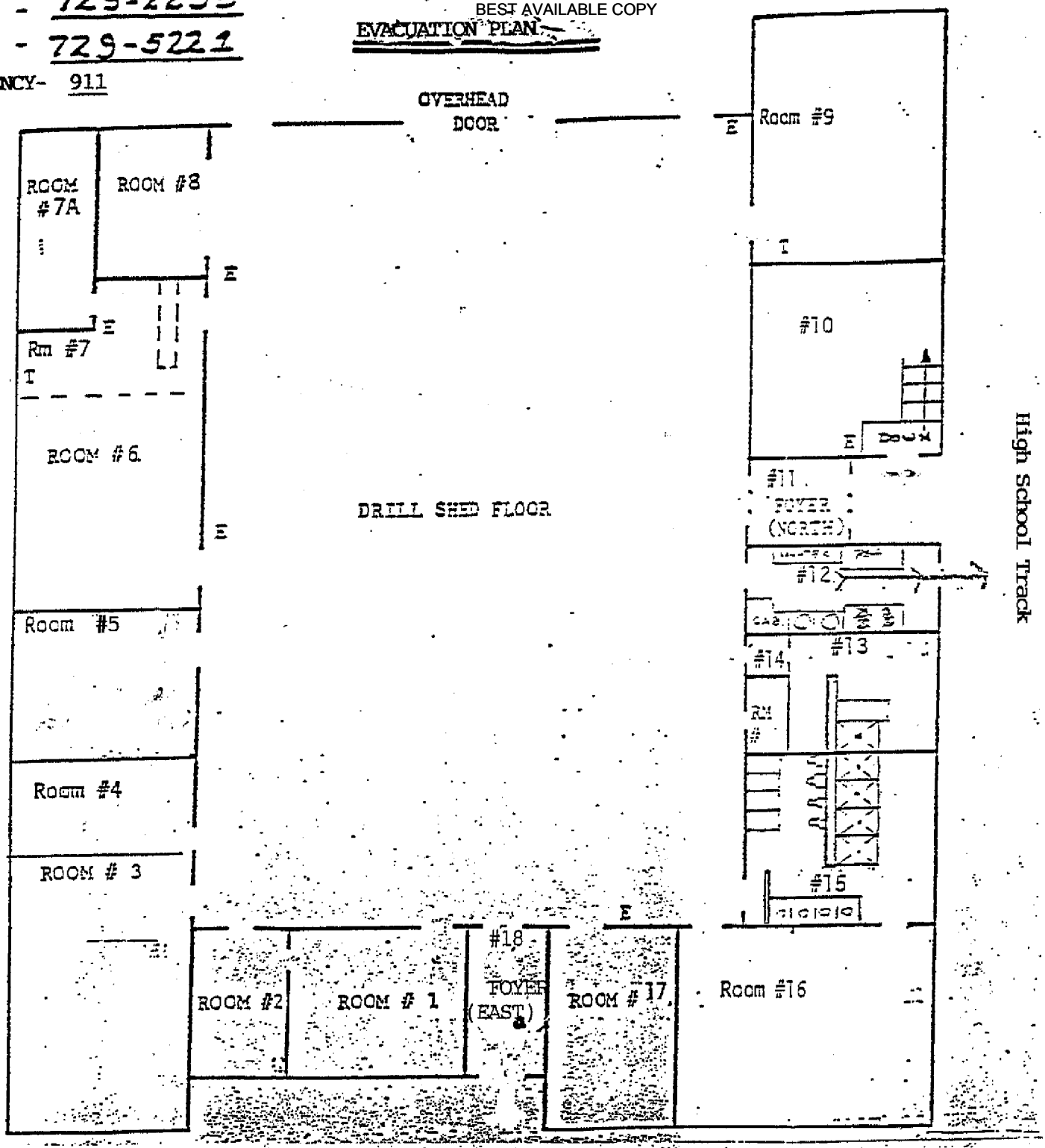
EVACUATION PLAN



ROOM #1 Orderly Room
ROOM #2 1SGs Office
ROOM #3 Classroom
ROOM #4 Cdr's Office
ROOM #5 Recruiters Office
ROOM #6 Supply Room
ROOM #7 HQs Room
ROOM #7A Arms Vault
ROOM #8 Storage Area
ROOM #9 Day Room
ROOM #10 Boiler Room
ROOM #11 Foyer North
ROOM #12 Kitchen
ROOM #13 Female Latrine
ROOM #14 Caretakers Room
ROOM #15 Men;s Room
ROOM #16 Locker Room
ROOM #17 Fitness Room
ROOM #18 Foyer East

FOIA Requested Record #J-15-0085 (CT)
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Page 293 of 1092

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Appendix B
Certificates of Analysis

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Naugatuck RC	**Chain Of Custody:**	513789
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Naugatuck, CT	**Date Submitted:**	8/30/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/5/2012 **Report Date:** 9/5/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
12089813	Naug-W 01	Flame	Wipe	****	0.108	110	ug/ft²	1100	9900	ug/ft²	
12089814	Naug-W 02	Flame	Wipe	****	0.108	110	ug/ft²	190	1700	ug/ft²	
12089815	Naug-W 03	Flame	Wipe	****	0.108	110	ug/ft²	51	470	ug/ft²	
12089816	Naug-W 04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089817	Naug-W 05	Flame	Wipe	****	0.108	110	ug/ft²	33	310	ug/ft²	
12089818	Naug-W 06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089819	Naug-W 07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089820	Naug-W 08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089821	Naug-W 09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089822	Naug-W 10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089823	Naug-W 11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Naugatuck RC	**Chain Of Custody:**	513789		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Naugatuck, CT	**Date Submitted:**	8/30/2012		
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/5/2012	**Report Date:**	9/5/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analys Non-Responsive

Technical Manage Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Naugatuck RC	**Chain Of Custody:**	513789
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Naugatuck, CT	**Date Analyzed:**	9/5/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12089824	Naug-Bulk 1	NAD	--	--	--	--	--	--	--	--	5	95	Glue	Brown	Homogeneous	SW	
12089825	Naug-Bulk 2	NAD	--	--	--	--	--	--	40	--	--	60	CT	Multi	Layered	SW	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Director Non-Responsive **Analyst(s)** Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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4475 Forbes Blvd. · Lanham, MD, 20706 · (301) 459-2640 · Toll Free (800) 346-0961 · Fax (301) 459-2643
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Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 8/28/12

Job Site: Naugatuck RC

Project No.: J12-676

Inspect[redacted]

Sample No.	Sample Type	Sample Location	Dimensions (Area)
Navy-W01	Lead	Arms Room floor (~~Concrete~~ Parquet)	10X10cm
W02		Comms Room floor (concrete)	
W03		Supply Room floor (concrete)	
W04		Drill Hall dusty corner	
W05		Drill Hall top of floor Cab	
W06		Drill Hall Armosty box	
W07		Drill Hall floor under return	
W08		Drill Hall floor near fitness center	
W09		Kitchen table next to microwave (Stainless steel)	
W10		CR floor VCT	
W11	↓	fitness Floor (rubber)	
Navy-bulk-01	(Asbestos)	spline ceiling Tile mastic patty	(1st Office)
Navy-bulk-02	(Asbestos)	spline ceiling (1st Office)	

wood floor

vinyl floor

for TPR

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OWI (410) 247-2024 Naugatuck RC CTARNG 459262 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 513789

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: Naugatuck RC
2. Job Location: Naugatuck, CT
3. Job #: J12-6276 [redacted] PO #: W912K8-09-A-0003
4. Contact Perso [redacted]
5. Submitted by: [redacted]

Reporting Information (Results will be provided [redacted])

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☐ 5 Day +
☐ 2 Day Date Due: 9/7/12
☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
[redacted] rmy.mil
[redacted] rmy.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)
TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☑ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
☐ Pb Paint Chip (QTY)
☑ Pb Dust Wipe (wipe type 10X10cm) 11 (QTY)
☐ Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
	See Attached Sheets															

CLIENT CONTACT (LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 8/30/12 @ 1030 Via: FED [redacted]
2. Date/Time Analyze [redacted] @ By (Print) [redacted]
3. Results Reported T [redacted] Via: Email Date: 9/7/12 Time: Initial: SW
4. Comments: 7987 9722 0273

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FOIA Requested Record #J-15-0089(CT)
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Page 299 of 1092

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Appendix C
Photo Documentation

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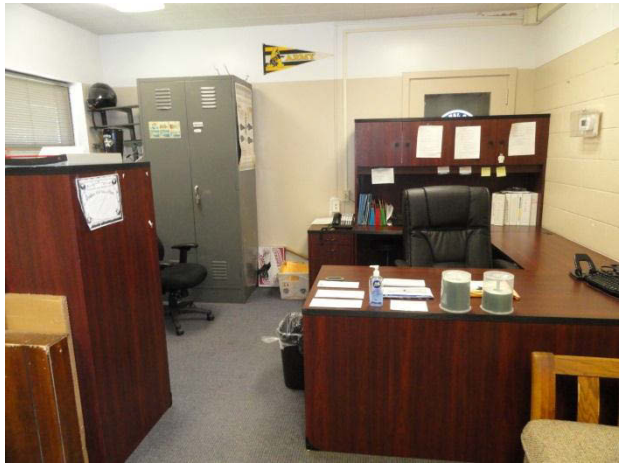
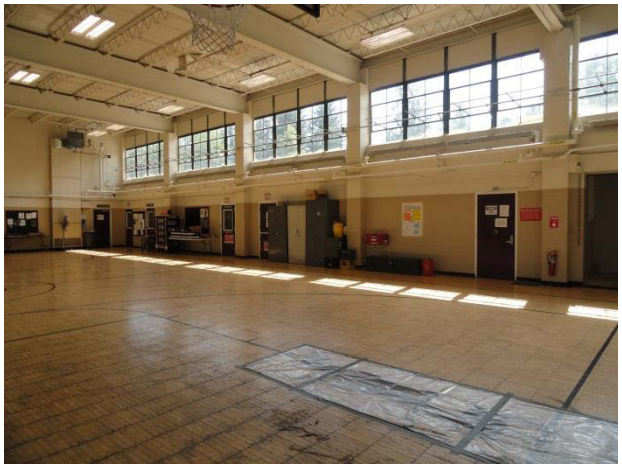
Naugatuck, CT Readiness Center

Exterior View of RC



Office



Drill Hall

Fitness Center

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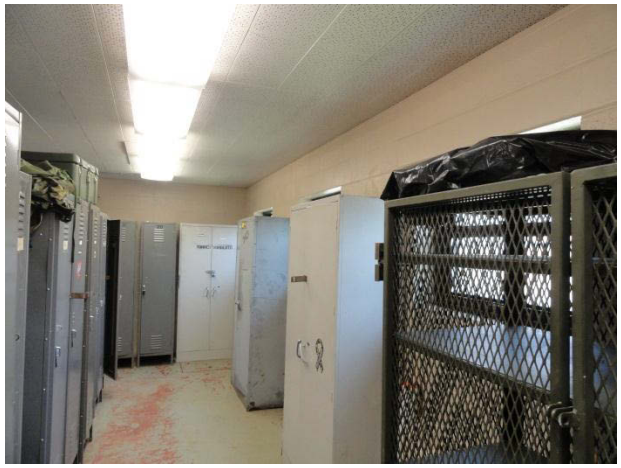
Naugatuck, CT Readiness Center



Locker Room

Cleaning Products

Kitchen

Flammable Storage in Drill Hall

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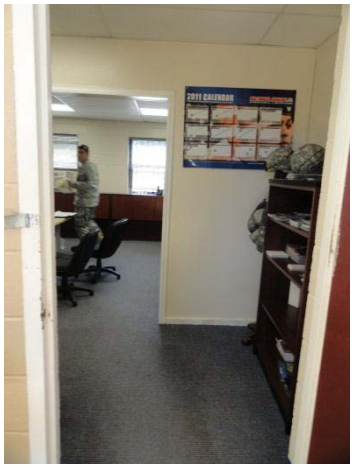
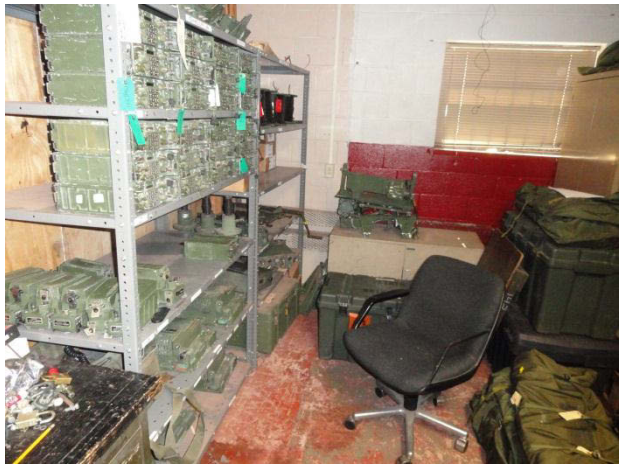
Naugatuck, CT Readiness Center



Office

Chemical Storage

Supply Office and Former Range



Commo and NBC Room (Former Range)

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Naugatuck, CT Readiness Center

Spline ceiling tile coming unglued

Office

Classroom

Damaged Spline Ceiling Tile and mastic patties

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Appendix D
IAQ and Lighting Survey Log Sheets

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	Naugatuck	IAQ							Light		
Date	8/28/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296					Serial Number		3021
Weather Conditions				Last Calibration		Mar-12					Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Fitness Center		3	13:25	81.2	X	64.9	X	398		0.4		21-128	X	30
Locker Room		3	13:26	80.7	X	66.1	X	376		0.0		15-120		7
Men's Bathroom		1	13:27	80.6	X	71.0	X	414		0.0		36-190		5
Women's Bathroom		2	13:28	80.3	X	69.7	X	603		0.1		40-110		5
Custodial Closet		2	13:29	80.4	X	69.4	X	430		0.0		140-150		30
Kitchen		2	13:30	81.3	X	69.3	X	363		0.1		200-276		50
Supply		4	13:31	81.4	X	61.8	X	360		0.2		45-165		30
Arms Vault		3	13:37	81.1	X	65.5	X	383		0.1		5-74	X	10
NBC/Com Room		4	13:37	80.6	X	64.9	X	385		0.2		8-100	X	30-50
Drill Hall		5	13:40	81.8	X	63.8	X	354		0.0		80-300		50
Recruiting Office		3	13:41	80.9	X	58.4		483		0.1		70-130		30-50
Commander's Office		2	13:46	84.3	X	53.4		480		0.1		38-72		30-50
Classroom		2	13:46	84.3	X	57.0		560		0.1		52-96		30-50
1st Sergeant Office		2	13:49	83.5	X	57.6		489		0.1		60-90		30-50
Readiness NCO Office		2	13:51	82.5	X	59.6		380		0.1		50-90		30-50
Outside			13:45	82.5		59.6		323		0.0				

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, Connecticut 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
NEW BRITAIN ARMORY
NEW BRITAIN, CONNECTICUT

June 2006
PN: 39741509

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 307 of 1092

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TABLE OF CONTENTS

Section **Page**

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 308 of 1092

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TABLE OF CONTENTS (Cont)

APPENDICES

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate.	Increase illumination through use of task lighting. (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in wipe samples collected from the firing range in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range and administrative area where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Mold		
Water damaged was observed throughout. Mold growth could become an issue if left unattended.	Determine and repair source of water. Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4
Electrical Safety		
Electrical panels obstructed by equipment in` the boiler room.	Electrical panels must be kept clear of obstructions for a minimum of 3 feet (OSHA 29 CFR 1910.303(g)(1)(i)).	RAC 5

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 310 of 1092

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the New Britain Armory located at 855 Stanley Street in New Britain, Connecticut 06051. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On September 15, 2005, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in New Britain, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Mr. Non-Responsive site contact for this survey.

This armory is a single-story brick and block building, with an attached drill hall, that is constructed primarily of brick and mortar. This facility is built on a concrete slab, with a pitched asphalt roof. The building was constructed in 1982. A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 311 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. This was particularly true for part time employees. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning workstations at the time of this survey.

Water-damaged ceiling tiles were observed throughout the administrative area.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the day room, infantry orderly room and outside. These readings were all measured using a TSI Q-Trak ^{TM} (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 45-66 % throughout the various building areas with an average of 55.5%. The average reading was below the recommended maximum of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from 500 to 540 parts per million (ppm), with an average of 520 ppm. The outside reading was 440 ppm.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 312 of 1092

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given a background level of 440 ppm on the day of the survey, the ASHRAE limit would be 1,140 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 1 to 2 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 313 of 1092

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (lux / foot candles)	Recommended Lighting (lux / foot candles)
Classroom #2	Classroom	787 / 73	500 /50
Learning Center	Classroom	572 / 54	500 / 50
Administration	Office	380 / 35	500 / 50
Office #1	Office	328 / 30	500 / 50
Office #2	Office	378 / 36	500 / 50

On the day of the survey was adequate in the two classrooms but inadequate in the three offices.

2.2.5 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) by Mr. Non-Responsive for a determination of asbestos content. These materials included skim and base coat plaster from the kitchen area. All samples were reported as No Asbestos Detected. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020, EPA-600/R-93-116.

Table 2-2
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Kitchen	Skim Coat Plaster	0915-21A	NAD
Kitchen	Skim Coat Plaster	0915-21B	NAD
Kitchen	Skim Coat Plaster	0915-21C	NAD
Kitchen	Base Coat Plaster	0915-22A	NAD
Kitchen	Base Coat Plaster	0915-22B	NAD
Kitchen	Base Coat Plaster	0915-22C	NAD

NAD: No Asbestos Detected

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 314 of 1092

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)).

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in the three offices and generally throughout the facility. URS recommends increasing the area lighting or supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

MOLD: Water-damaged ceiling tiles were observed throughout the administrative area. Mold could become a problem if the water source is not corrected.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 315 of 1092

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3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now used for an NCO and storage room.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead dust was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Indoor Firing Range

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
NCO Floor near Entrance	0915-05	10x10 cm	6.3	200
Floor Between NCO and Storage	0915-06	10x10 cm	85	200
Center of storage-Floor	0915-07	10x10 cm	500	200
Storage- top of Shelf	0915-08	10x10 cm	110	200
Bullet Trap	0915-09	10x10 cm	1400	200
Blank	0915-04	N/A	<0.3	200

An air sample for lead was collected in the former indoor firing range. Table 3-2 below shows the result of these air samples.

FOIA Requested Record #J-15-0085 (CT)
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Page 316 of 1092

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Table 3-2
Airborne Concentration of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Action Level ($\mu g/m^3$)
Former Firing Range Center	0915-01	320	<9.4	30.0
Blank	0915-03	N/A	<3 µg	N/A

On the day of the survey, the airborne lead dust level in the former indoor firing range was found to be below the OSHA action level of 30.0 $\mu g/m^3$ averaged over an 8-hour day.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: One wipe sample collected from the former indoor firing range for lead was found to be above the allowable limit requiring that the former firing range be cleaned. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Guidelines for the cleaning and rehabilitation of former indoor firing ranges is contained in Appendix H.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 317 of 1092

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4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a concrete floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall Center- Floor	0915-10	10x10 cm	3.3	200
Drill Hall Outside Classroom 1	0915-11	10x10 cm	130	200
Drill Hall- Near Exit to Parking Lot	0915-12	10x10 cm	7.4	200
Drill Hall- Near Administration Area	0915-13	10x10 cm	14	200
Drill Hall- Outside Learning Center	0915-14	10x10 cm	5.4	200
Blank	0915-04	N/A	<0.3 μg	N/A

One air sample for lead was collected in the drill hall. Table 4-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 318 of 1092

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Table 4-2
Airborne Concentration of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Action Level ($\mu g/m^3$)
Drill Hall	0915-02	240	<13	30.0
Blank	0915-03	N/A	<3 µg	N/A

On the day of the survey, the airborne lead dust level in the drill hall was found to be below the OSHA action level of 30.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be below allowable limits and require no cleaning or further testing. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 319 of 1092

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5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping. An obstructed electrical panel was observed in the boiler room.

5.2 Chemical and Physical Agents Sampled

5.2.1 Asbestos

Asbestos-containing thermal system insulation was not observed in the boiler room.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
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Page 320 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was found regarding hazard communication. Training records are maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

FOIA Requested Record #J-15-0085 (CT)
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Page 321 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

FOIA Requested Record #J-15-0085 (CT)
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Page 322 of 1092

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APPENDIX A

ARMORY DRAWING

FOIA Requested Record #J-15-0085 (CT)
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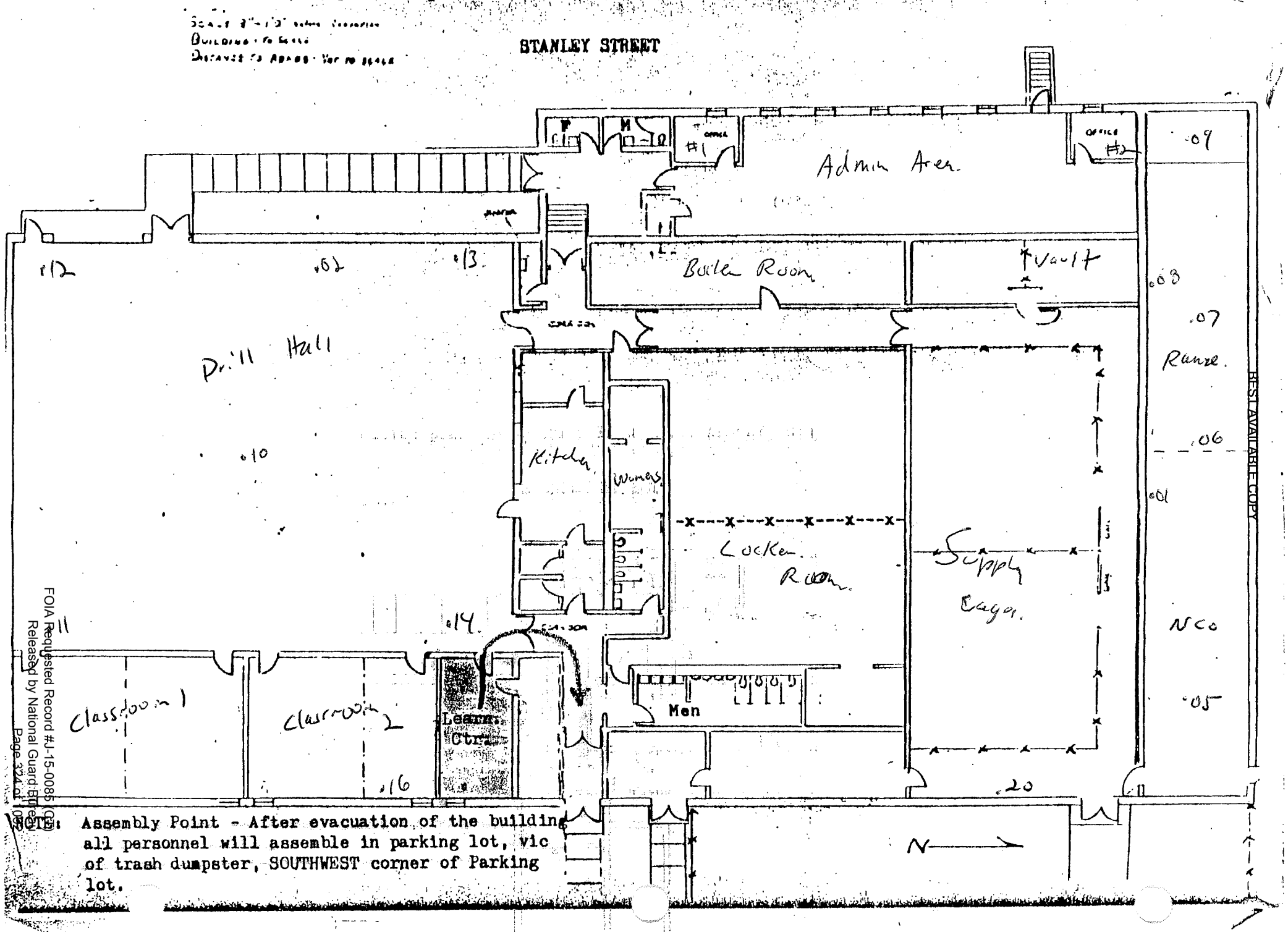
evacuation plan EVACUATION PLAN, N.G. ARMORY, NEW BRITAIN, CT



NOTE: Assembly Point - After evacuation of the building all personnel will assemble in parking lot, vic of trash dumpster, SOUTHWEST corner of Parking lot.

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Page 324 of 1000

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APPENDIX B

PERSONNEL LIST

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PERSONEL LIST
NEW BRITAIN ARMORY

Name	Rank
Non-Responsive	SFC
	SSG
	SFC
	SGT

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APPENDIX C

HAZARDOUS MATERIALS LIST

FOIA Requested Record #J-15-0085 (CT)
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Page 327 of 1092

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HAZARDOUS MATERIAL INVENTORY LIST

container # of

NSN	Nomenclature	Size	Quantity	MSDS #
Shelf 1				
MEYER	HYDRAULIC FLUID		1 QT	6
30 SAE OIL			1 QT	1
30 SAE OIL			1 CAN	1
3 IN ONE OIL			1 CAN	1
RUSTOLIUM	RUSTREFORMER		8 OZ	1
BEHR	SEALER WATERPROOFER		1 GALLON	1
Shelf 2				
GASOLINE OIL MIX			5 GALLON	1 Gal
Shelf 3				
GASOLINE OIL MIX			5 GALLON	1 Gal
GASOLINE			5 GALLON	5 ½

FOIA Requested Record #J-15-0085 (CT)
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Page 328 of 1092

USE OF ITEMS IN CABIN PROHIBITED TURN IN ITEMS ONLY

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HAZARDOUS MATERIAL INVENTORY LIST

NSN	Nomenclature	Size	Quantity	MSDS #
Shelf 1				
	DECON KIT		3 KITS	
	STARTING FLUID		11 OZ	1
	GAS LINE FREEZE UP		12 OZ	1
			10 Z	1
	LUBRICATING OIL		1 quart	1
	ROOF CEMENT			
	[redacted]			
Shelf 2				
Shelf 3				

Container # of

FOIA Requested Record #J-15-0085 (CT)
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Page 329 of 1092

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HAZARDOUS MATERIAL INVENTORY LIST

container of

NSN	Nomenclature	Size	Quantity	[redacted] #
Shelf 1				
WD 40		7.5 OZ		1
SO SURE	PAINT OLIVE GREEN	10 OZ		2
SO SURE	PAINT OLIVE DRAB	10.5 OZ		3
SO SURE	PAINT GLOSS WHITE	10.5 OZ		2
~~ROYAL LUB~~	~~CLP CLEANER LUBERICANT~~	~~1 GA~~		
Shelf 2				
ROYAL LUB	CLP CLEANER LUBENICANT	1 GALLON		6
Shelf 3				
GASOLINE		5 GALLON		2 ½ Gal

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Page 330 of 1092

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APPENDIX D

ANALYTICAL RESULTS

FOIA Requested Record #J-15-0085 (CT)
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10/04/2005 08:32 #428 P01/01 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.774

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A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	New Britain Armory	**Chain Of Custody:**	144188
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Storage/Assembly	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	9/30/2005 **Report Date:** 04-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0568505	0915 04	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0568506	0915 05	Furnace	Wipe	****	0.111	2.70	ug/ft²	6.3	ug/ft²	
0568507	0915 06	Furnace	Wipe	****	0.111	67.51	ug/ft²	85	ug/ft²	
0568508	0915 07	Furnace	Wipe	****	0.111	13.50	ug/ft²	500	ug/ft²	
0568509	0915 08	Furnace	Wipe	****	0.111	67.51	ug/ft²	110	ug/ft²	
0568510	0915 09	Furnace	Wipe	****	0.111	675.07	ug/ft²	1400	ug/ft²	
0568511	0915 10	Furnace	Wipe	****	0.111	2.70	ug/ft²	3.3	ug/ft²	
0568512	0915 11	Furnace	Wipe	****	0.111	67.51	ug/ft²	130	ug/ft²	
0568513	0915 12	Furnace	Wipe	****	0.111	2.70	ug/ft²	7.4	ug/ft²	
0568514	0915 13	Furnace	Wipe	****	0.111	2.70	ug/ft²	14	ug/ft²	
0568515	0915 14	Furnace	Wipe	****	0.111	2.70	ug/ft²	5.4	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Technical Manager: [redacted]

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	New Britain Armory	**Chain Of Custody:**	145338
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Armory/Admin/Classes	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	10/28/2005

Report Date: 28-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0604357	0915-15	Furnace	Wipe Blank	****	N/A	0.30	ug	2.3	ug	
0604358	0915-16	Furnace	Wipe	****	0.108	2.79	ug/ft²	7.2	ug/ft²	
0604359	0915-17	Furnace	Wipe	****	0.108	2.79	ug/ft²	25	ug/ft²	
0604360	0915-18	Furnace	Wipe	****	0.108	2.79	ug/ft²	10	ug/ft²	
0604361	0915-19	Furnace	Wipe	****	0.108	69.70	ug/ft²	71	ug/ft²	
0604362	0915-20	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.0088	%Pb	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] **Technical Manager:** [redacted]

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	144199
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	New Britain Armory CT	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	39741509.00401	**Date Analyzed:**	9/28/2005
Attention:	[redacted]				**Report Date:** 28-Sep-05

Summary of Atomic Absorption Analysis for Lead

Page 1 of 1

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0568334	0915 01	Flame	Air	320	N/A	9.38	ug/m³	<	9.4	ug/m³	
0568335	0915 02	Flame	Air	240	N/A	12.50	ug/m³	<	13	ug/m³	
0568336	0915 03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted] Non-Responsive

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10/04/2005 12:01 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.763 003

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CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	144203
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	New Britain Armory	**Date Analyzed:**	9/30/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted] Non-Res
		P.O. Number:	Not Provided		

Attention: [redacted] Non-Res

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments
0568315	0915 21A	NAD	–	–	–	–	–	–	–	–	–	100	Off-White	Homogeneous	CK	
0568316	0915 21B	NAD	–	–	–	–	–	–	–	–	–	100	Off-White	Homogeneous	CK	
0568317	0915 21C	NAD	–	–	–	–	–	–	–	–	–	100	Off-White	Homogeneous	CK	
0568318	0915 22A	NAD	–	–	–	–	–	–	–	–	–	100	Gray	Homogeneous	CK	
0568319	0915 22B	NAD	–	–	–	–	–	–	–	–	–	100	Gray	Homogeneous	CK	
0568320	0915 22C	NAD	–	–	–	–	–	–	–	–	–	100	Gray	Homogeneous	CK	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

[redacted] Non-Responsive

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APPENDIX E

TRAINING CERTIFICATES

FOIA Requested Record #J-15-0085 (CT)
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May-04-05 09:34am From-URS CORPORATION T-867 P.03/05 F-090

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted] Non-Responsive

has completed the requisite training, and has passed an examination for reaccreditation

Asbestos Project Monitor Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

For course participants seeking New York State certification or New York State training reciprocity, the official record of successful completion is the DOH 2832 Certificate of Completion of Asbestos Safety Training

February 16, 2005
Course Dates

February 16, 2005
Examination Date

February 16, 2006
Expiration Date

05739517413670
Certificate Number

[redacted] Non-Responsive

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Page 338 of 1092

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APPENDIX F

PHOTOGRAPHS

FOIA Requested Record #J-15-0085 (CT)
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Page 339 of 1092

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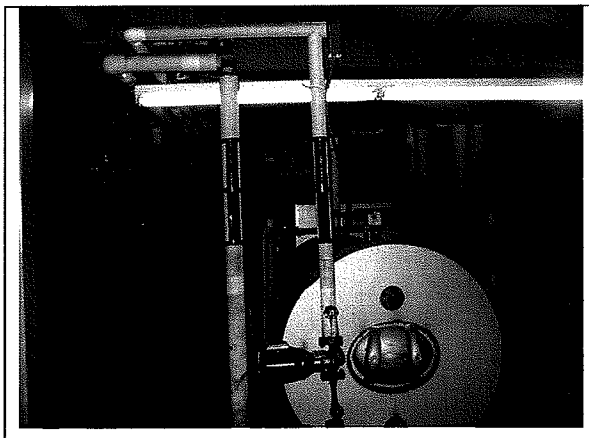

Photo 7097: Boiler Room – Boilers

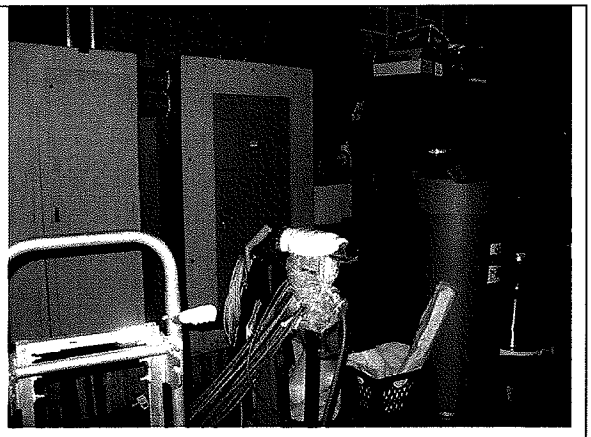

Photo 7098: Boiler Room – Obstructed Electrical Box

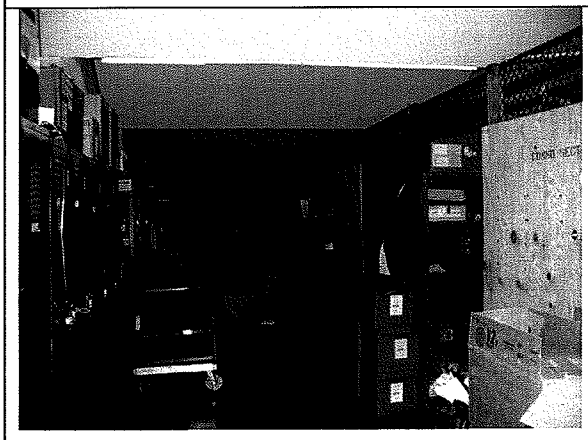

Photo 7099: Former Firing Range

Photo 7100: Former Firing Range – Bullet trap with sand

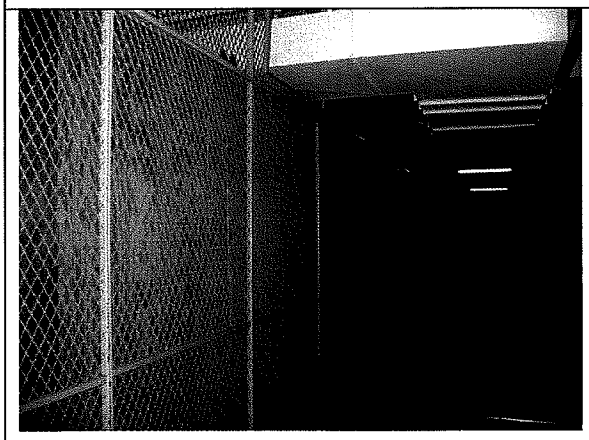

Photo 7101: Supply Area

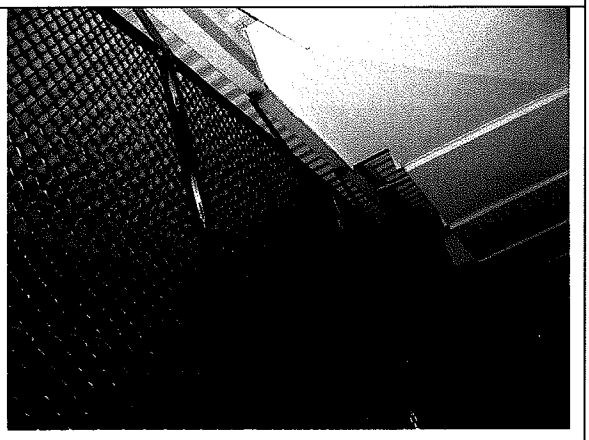

Photo 7102: Locker Room

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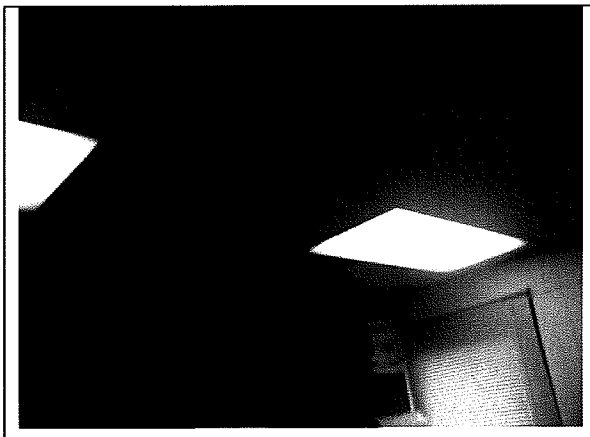

Photo 7103: Administrative Area – Water Damaged Ceiling Tiles

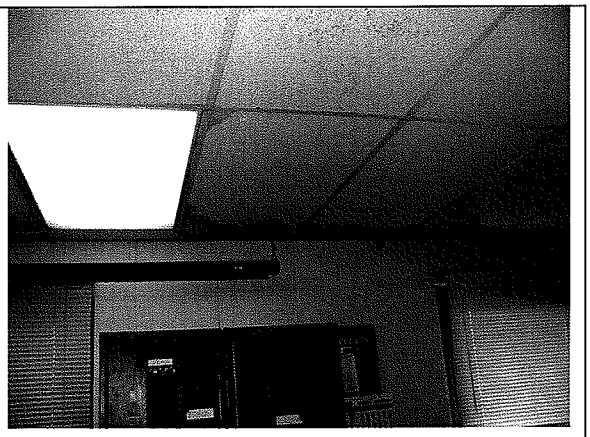

Photo 7104 : Administrative Area – Water Damaged Ceiling Tiles

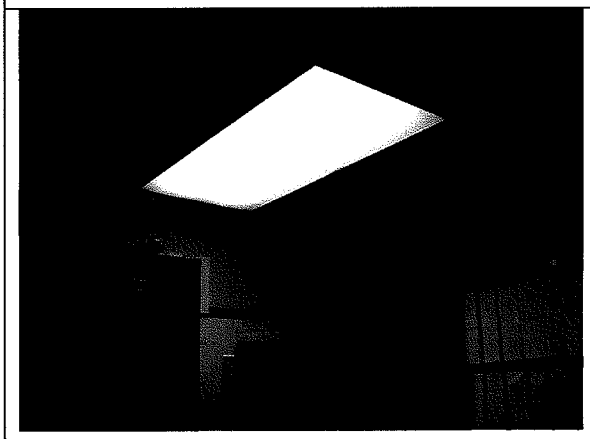

Photo 7105: Administrative Area – Water Damaged Ceiling Tiles

Photo 7106: Administrative Area – Water Damaged Ceiling Tiles

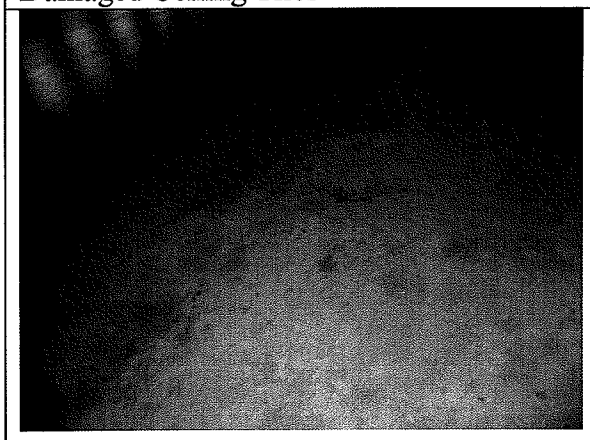

Photo 7107: Drill Hall - IFloor

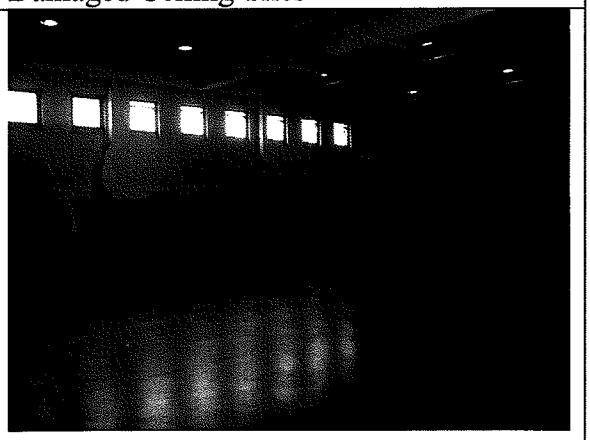

Photo 7108: Drill Hall

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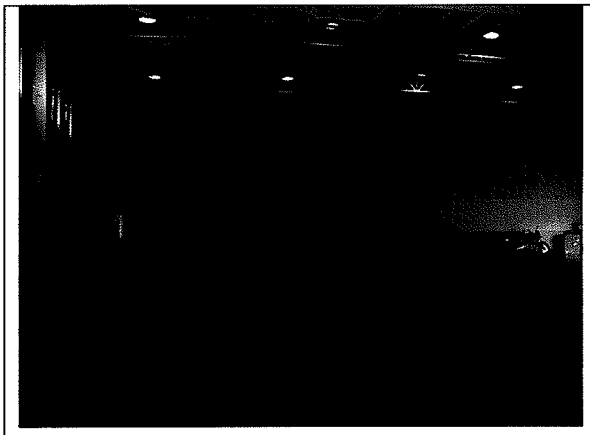

Photo 7109: Drill Hall

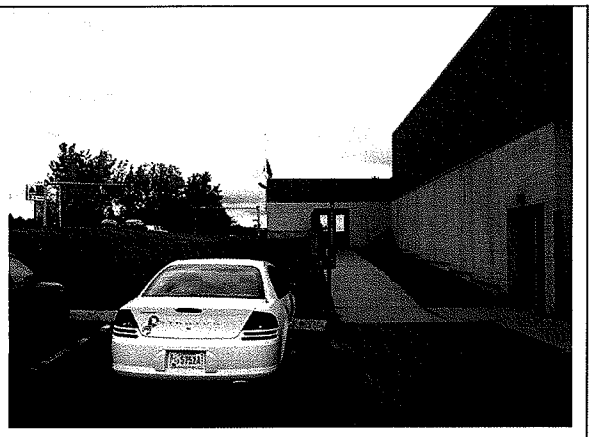

Photo 7110: Exterior View

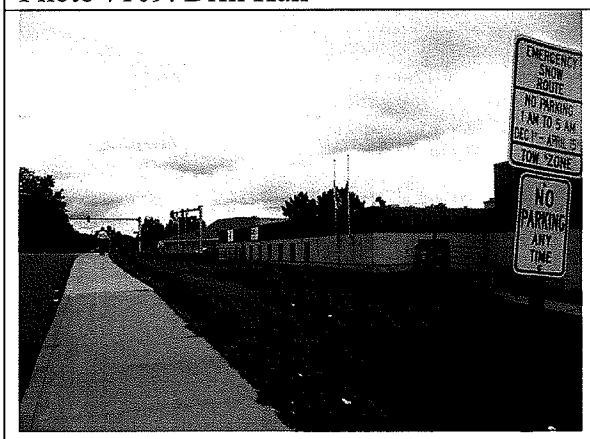

Photo 7111: Exterior View

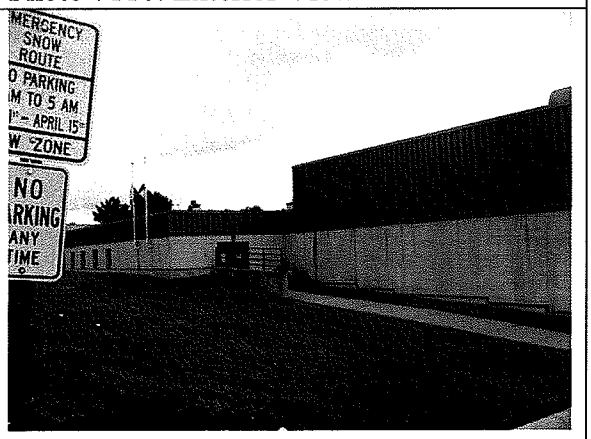

Photo 7112: Exterior View

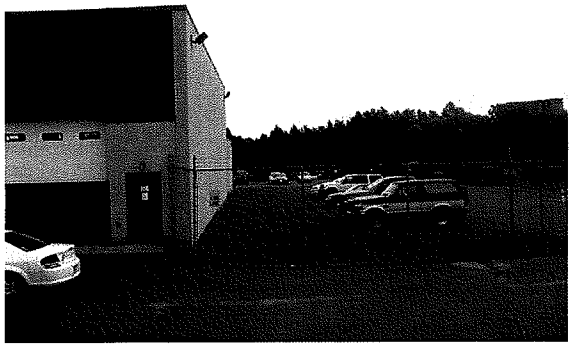

Photo 7113: Exterior View

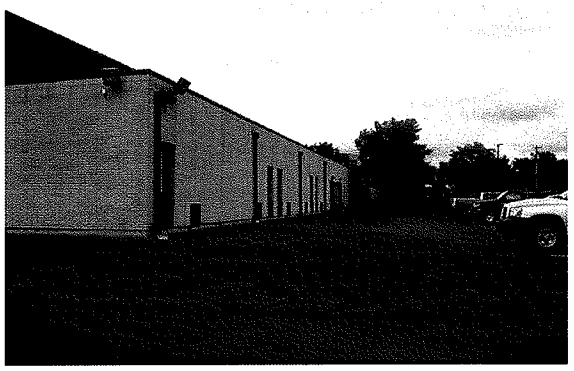

Photo 7114: Exterior View

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 343 of 1092

BEST AVAILABLE COPY

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building,

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15 30 DECEMBER 2002)

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 347 of 1092

BEST AVAILABLE COPY

3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman ™ #40 paper

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 348 of 1092

BEST AVAILABLE COPY

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 349 of 1092

BEST AVAILABLE COPY

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 350 of 1092

BEST AVAILABLE COPY

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 351 of 1092

BEST AVAILABLE COPY

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 352 of 1092

BEST AVAILABLE COPY

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 353 of 1092

BEST AVAILABLE COPY

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 354 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 355 of 1092

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APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 356 of 1092

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet			
Return Address		Point of Contact *(name & phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			
Sampling Data			

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 357 of 1092

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 358 of 1092

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APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 359 of 1092

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APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 360 of 1092

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 361 of 1092

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Industrial Hygiene Survey

Connecticut Army National Guard (CT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

New Britain Readiness Center
855 Stanley Street
New Britain, CT 06051

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: August 27, 2012

AEI Project #: J12-676 3h CT New Britain RC

_____

Non-Responsive, **CIH, CSP, LEED Green Associate**
Industrial Hygienist

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 362 of 1092

Table of Contents

List of Tables and Appendices

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 363 of 1092

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) New Britain Readiness Center located at 855 Stanley Street, New Britain, CT 06051. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 27, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on ceiling near the shower and above the exit door in the supply storage area. Paint chip samples were collected and submitted for lead analysis. The paint chip samples were below 0.5% lead by weight and are not considered lead-based paint. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for one sample collected from the fitness center floor. Surfaces contaminated with lead dust should be cleaned using wet methods or high efficiency particulate air (HEPA)-filtered vacuums.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged floor tile with black mastic was observed in the supply storage area that is the former firing range. Samples of the floor tile and mastic were collected and submitted for asbestos analysis. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. No asbestos was detected in the floor tile sample; however, 5% Chrysotile asbestos was detected in the mastic sample. These materials should be treated appropriately during renovations in accordance with the facility's asbestos hazard management plan required by Army Regulation (AR) 420-1.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of mold growth was observed; however, evidence of water intrusion in the form of concrete efflorescence and peeling paint was observed in the supply storage area near the exit door.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable with room for improvement.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 3 foot candles (fc) to 240 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly acceptable compared to the comfort ranges for the summer season on the day of the survey. The outdoor

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 364 of 1092

temperature and relative humidity were 79.7° F and 70.1% on the day of monitoring, and indoor conditions were similar to outdoor conditions. The facility has air-conditioning units in some areas. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide were below the recommended concentrations in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program dated 1988 was found in an old notebook. MSDSs were readily available and up to date as required by the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200. It is recommended that the written hazard communication program be updated and placed in every MSDS notebook along with any related training records.

Overall, the New Britain Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 365 of 1092

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) New Britain Readiness Center located at 855 Stanley Street, New Britain, CT 06051. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 27, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The New Britain Readiness Center was built in 1983. The readiness center is staffed by 9 National Guard administrative personnel, 1 civilian caretaker (maintainer) and 2 other civilian personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the New Britain Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the New Britain facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state employed maintainer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 366 of 1092

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for damaged building materials that may contain asbestos or lead-based paint, for water damage or mold problems; for potential ergonomic problems; and for housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on ceiling near the shower and above the exit door in the supply storage area. Paint chip samples were collected and submitted for lead analysis. Results are given in Table 1 and certificates of analysis are included in Appendix B. The paint chip samples were below 0.5% lead by weight and are not considered lead-based paint.

Table 1 – Results of Paint Chip Sampling for CTARNG New Britain Readiness Center on August 27, 2012.

Sample #	Sample Location	Lead Result (% by wt)
NB-Bulk-01	Peeling paint on the ceiling near the shower	0.018
NB-Bulk-02	Peeling paint from above the exit door in the supply area	<0.0064

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the state of Connecticut limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical Services, Inc. (AMA) of Lanham, MD for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Wipe samples collected from the facility were below the recommended maximum level for surface contamination in all areas except for the sample collected from the floor in the fitness center. Surfaces contaminated with lead dust should be cleaned using wet methods or high efficiency particulate air (HEPA)-filtered vacuums. Results are given in Table 2 and certificates of analysis are included in Appendix B.

Table 2 – Results of Dust Wipe Sampling for CTARNG New Britain Readiness Center on August 27, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
NB-W01	Drill Hall – top of flammable storage cabinet	<110

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 367 of 1092

Table 2 – Results of Dust Wipe Sampling for CTARNG New Britain Readiness Center on August 27, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
NB-W02	Drill Hall – serving counter	<110
NB-W03	Drill Hall – under microwave	<110
NB-W04	Drill Hall – desk top	<110
NB-W05	Drill Hall – top of shipping container	<110
NB-W06	Supply Storage Area – Former Firing Range – floor at firing end of range	<110
NB-W07	Supply Storage Area – Former Firing Range – floor near bullet trap end of range	<110
NB-W08	Supply Storage Area – Former Firing Range – floor in bullet trap area	<110
NB-W09	Kitchen – prep table	<110
NB-W10	Fitness Center – floor under table	**460**
NB-W11	Shower Room – floor at entrance	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft^2) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged floor tile with black mastic was observed in the supply storage area that is the former firing range. Samples of the floor tile and mastic were submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. No asbestos was detected in the floor tile sample; however, the mastic sample contained 5% Chrysotile asbestos. These materials should be treated appropriately during renovations in accordance with the facility's asbestos hazard management plan required by Army Regulation (AR) 420-1.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of mold growth was observed; however, evidence of water intrusion in the form of concrete efflorescence and peeling paint was observed in the supply storage area near the exit door.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 368 of 1092

following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 3 foot candles (fc) to 240 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 3. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 3 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 71.3 to 79.8° F and 48.8 to 62.5% Rh. Temperatures and relative humidity measurements were mostly within the comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 79.7° F and 70.1%, and conditions inside were similar to the outdoor conditions. This readiness center has air-conditioning units in some areas.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 402 to 595 parts per million (ppm). The outdoor CO_2 concentration was 328 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 369 of 1092

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.1 to 1.4 ppm; therefore all measurements were below the concentrations of concern.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program dated 1988 was found in an old notebook. MSDSs were readily available and up to date as required by the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200. It is recommended that the written hazard communication program be updated and placed in every MSDS notebook along with any related training records.

7 Conclusions

The results of the evaluation indicated a few minor concerns at the facility. Overall, the New Britain Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.

2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 370 of 1092

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3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 371 of 1092

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Appendix A
Building Layout

FOIA Requested Record #J-15-0085 (CT)
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evacuation plan EVACUATION PLAN, N.G. ARMORY, NEW BRITAIN, CT

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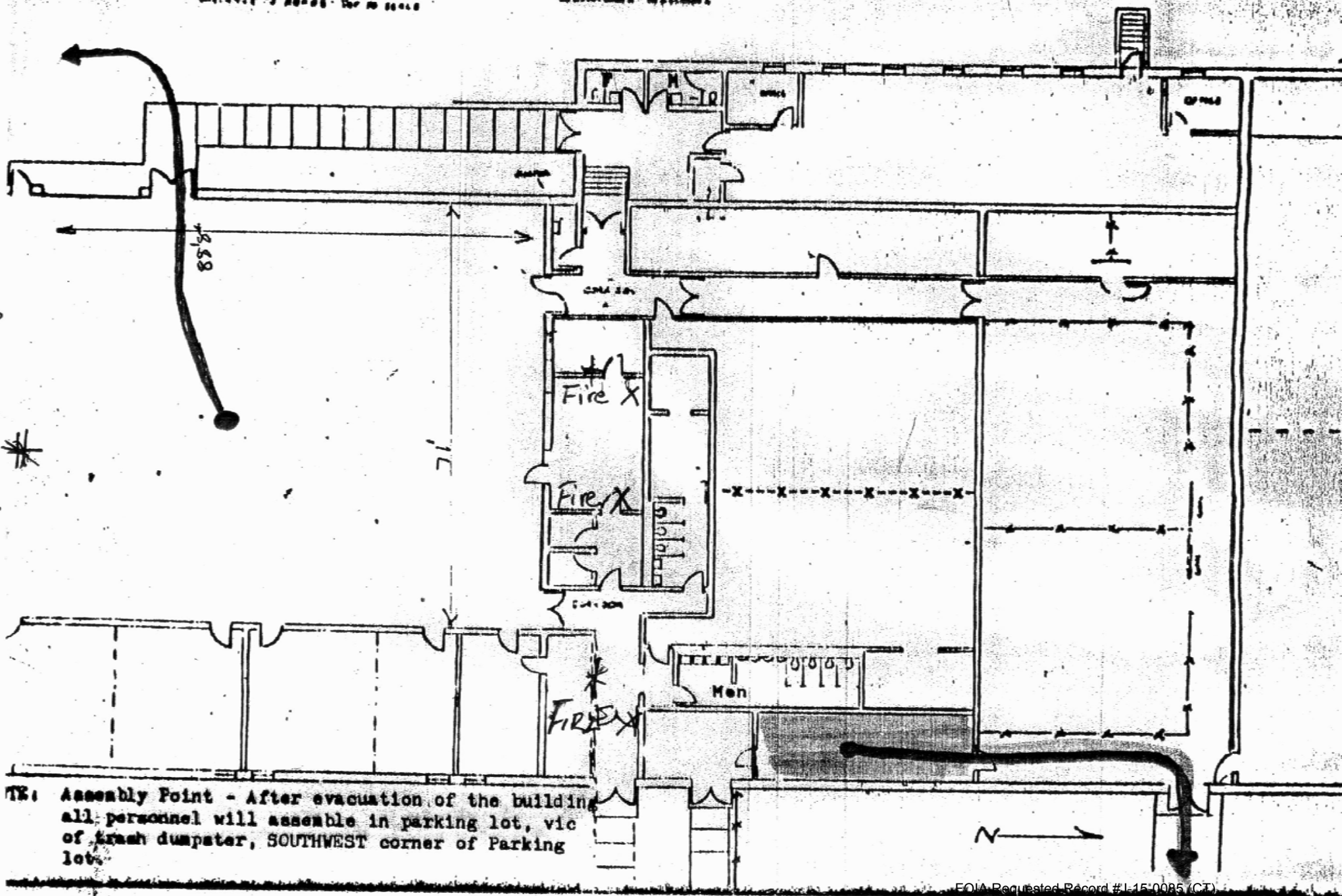

TE: Assembly Point - After evacuation of the building all personnel will assemble in parking lot, vic of trash dumpster, SOUTHWEST corner of Parking lot.

FOIA Requested Record # I-15-0085 (CT)
Released by National Guard Bureau

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Appendix B
Certificates of Analysis

FOIA Requested Record #J-15-0085 (CT)
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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	New Britain RC	**Chain Of Custody:**	513786
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	New Britain, CT	**Date Submitted:**	8/30/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/6/2012

Report Date: 9/6/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
12090044	NB-W 01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12090045	NB-W 02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12090046	NB-W 03	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12090047	NB-W 04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12090048	NB-W 05	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12090049	NB-W 06	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12090050	NB-W 07	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12090051	NB-W 08	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12090052	NB-W 09	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12090053	NB-W 10	Flame	Wipe	****	0.108	110	ug/ft^2	49	460	ug/ft^2	
12090054	NB-W 11	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12090055	NB-Bulk 01	Flame	Paint Chip	****	N/A	0.0076	%Pb		0.018	%Pb	
12090056	NB-Bulk 02	Flame	Paint Chip	****	N/A	0.0064	%Pb		<0.0064	%Pb	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

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ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	New Britain RC	**Chain Of Custody:**	513786
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	New Britain, CT	**Date Submitted:**	8/30/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/6/2012
Attention:	Non-Responsive			**Report Date:**	9/6/2012

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

An Non-Responsive

Technical Manager: Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	New Britain RC	**Chain Of Custody:**	513786
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	New Britain, CT	**Date Analyzed:**	9/6/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12090057	NB-Bulk 03	5	5	--	--	--	--	--	--	--	--	95	MS	Black	Homogeneous	SW	
12090631	NB-Bulk-03 FT	NAD	--	--	--	--	--	--	--	--	--	100	FT	Multi	Homogeneous	SW	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Director Non-Responsive **Analyst(s)** Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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OWI (410) 247-2024

New Britain RC STARNG

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AMA Analytical Services, Inc.

Focused on Results www.amalab.com
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4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 513786

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: New Britain RC
2. Job Location: New Britain, CT
3. Job #: 512-676 P.O. #: W912K6-09-A-0003
4. Contact Person: [redacted]
5. Submitted By: [redacted] Signature: [redacted]

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
- ☐ Immediate Date Due:
- ☐ 24 Hours Time Due:
- Comments:

NORMAL BUSINESS HOURS
- ☐ Immediate
- ☐ Next Day
- ☐ 2 Day
- ☐ 3 Day
- ☒ 5 Day + Date Due: 9/7/12
- ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO: [redacted] Report
[redacted]army.mil
[redacted]army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) 1 (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 1 (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
- ☐ Pb Paint Chip 2 (QTY)
- ☐ Pb Dust Wipe (wipe type 10x10cm) 11 (QTY)
- ☐ Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☐ Spore-Trap (QTY)
- ☐ Surface Swab (QTY)
- ☐ Surface Tape (QTY)
- ☐ Other (Specify) (QTY)
- ☐ Surface Vacuum Dust (QTY)
- ☐ Culturable ID Genus (Media) (QTY)
- ☐ Culturable ID Species (Media) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WATER AND OTHER	SPORE TRAP	TAPE	SWAB
	See attached Sheets															

CLIENT CONTACT

(LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 8/30/12 @ 1030 Via: FE [redacted]
2. Date/Time Analyzed: 9/7/12 @ By (Print) [redacted]
3. Results Reported To: [redacted] EST AVAILABLE Via: Date: Time: Initials:
4. Comments: 79810 / 22915

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SURFACE WIPE AND BULK SAMPLING
SURVEY SHEET

Date Collected: 8/27/12
Job Site: New Britain RC
Project No.: J12-076

Inspector: [redacted]

Sample No.	Sample Type	Sample Location	Dimensions (Area)
NB-W01	Lead	Drill Hall - facing south	10 x 10 cm
NB-W02	↓	Drill Hall - under microwave	
NB-W03		Drill Hall - desk	
NB-W04		Drill Hall - center of floor	
NB-W05		Drill Hall - top of stairway south.	
NB-W06		former IFR (Supply Cage) - firing floor	out of range
NB-W07		Former IFR " - near bullet pit side floor	
NB-W08		Former IFR " - floor in bullet pit	
NB-W09		Kitchen Island table	
NB-W10		fitness center - floor under table.	
NB-W11		Shower Room - floor @ entrance to showers	
NB-bulk-01	lead	Shower area - peeling paint	
NB-bulk-02	lead	Supply exit door - peeling paint	
NB-bulk-03	asbestos	floor tile & mastic from former IFR	

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Appendix C
Photo Documentation

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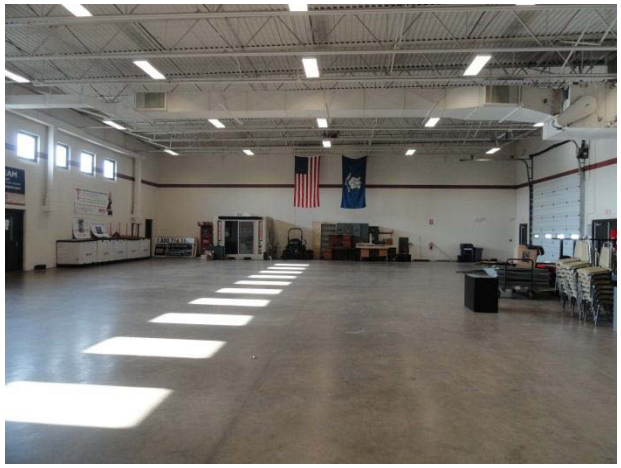

Drill Hall

Drill Hall

Drill Hall

Kitchen

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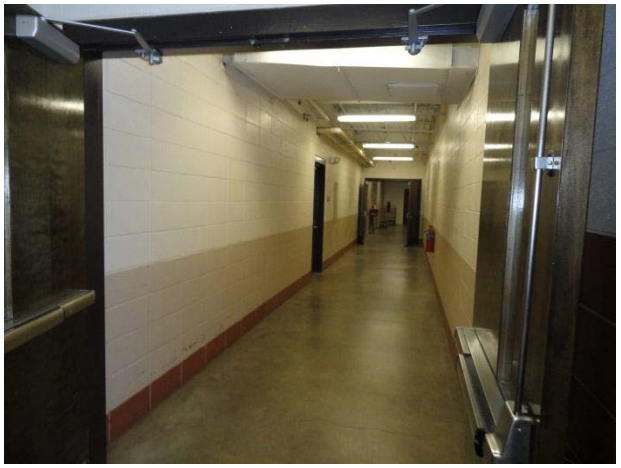
New Britain, CT Readiness Center

Kitchen



Hallway

Boiler Room

Supply Storage Area

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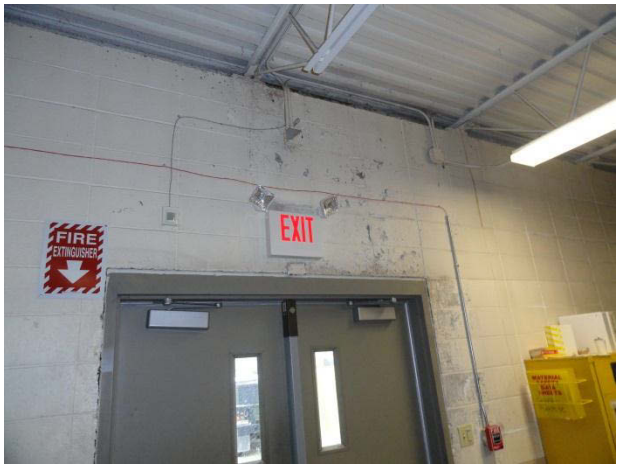
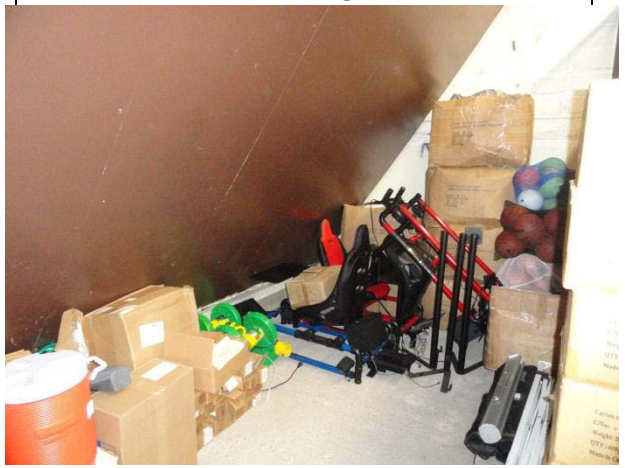
New Boiler



Supply Area Wall with Water Intrusion and Peeling Paint

Flammable Storage Cabinets



Former Bullet Trap Area

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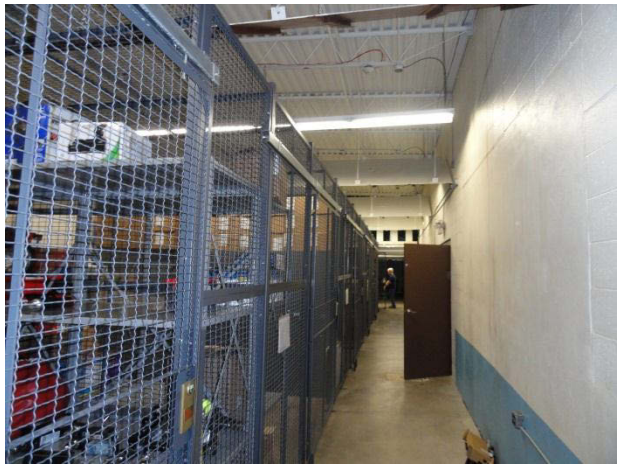

Storage Area and Former Range

Storage at Firing End of Former Range

Recruiting Lobby

Front Lobby

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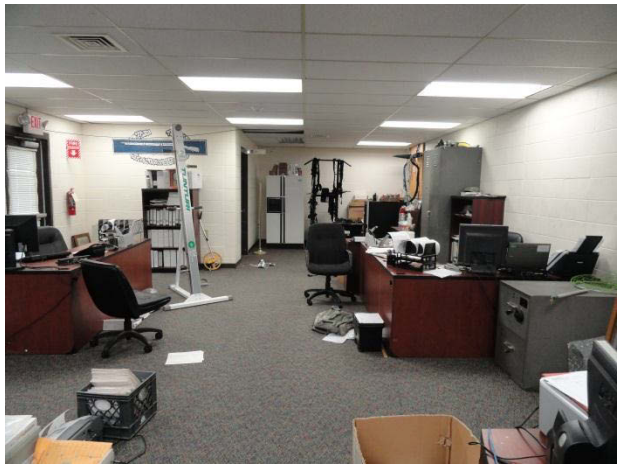
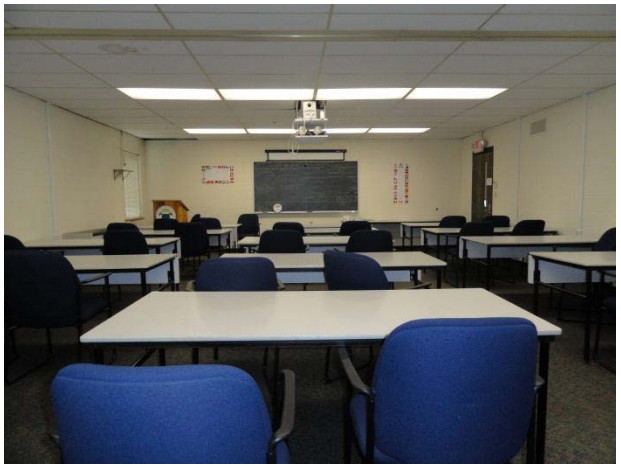


Office



Classroom

Office

Fitness Center

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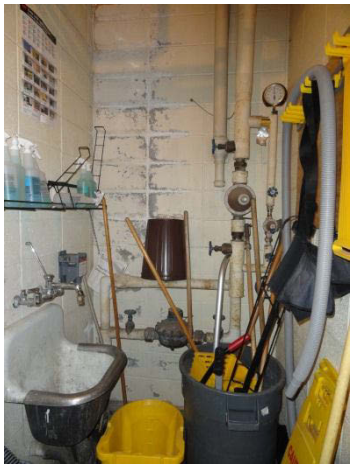
New Britain, CT Readiness Center



Custodial closet

Gang shower

Peeling Paint near Shower

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Appendix D
IAQ and Lighting Survey Log Sheets

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	New Britain	IAQ								Light		
Date	8/27/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296						Serial Number		3021
Weather Conditions				Last Calibration		Mar-12						Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Drill Hall		5	8:37	78.4		54.9		446		1.1		50-86		50
Kitchen		3	8:38	78.9		56.0		500		0.6		79-100		50
Storage A		2	8:39	79.2		53.8		492		0.5		90-110		30
Dish Washing Room		2	8:42	79.8		53.1		585		0.4		59-95		30
Boiler Room		3	8:45	78.8		56.0		481		0.2		13-90	X	30
Supply Cage		4	8:53	77.0		59.7		464		1.4		40-50		30
Former Firing Range		3	8:55	75.1		60.9	X	452		0.5		15-35	X	30
Former Firing Range		3	8:57	74.9		62.5	X	430		0.1		30-51		30
Recruiting Lobby		3	9:03	75.3		58.6		494		0.2		40-60		15
Women's Latrine		2	9:04	75.4		55.3		496		0.3		30-110		5
Command Office		3	9:05	73.0		55.2		497		0.1		37-125		30-50
Classroom		3	9:10	71.3	X	55.4		402		0.2		80-120		30-50
Office NCO		5	9:12	71.9	X	48.8		521		0.1		80-225		30-50
Office RSP		6	9:13	71.6	X	50.8		593		0.1		50-120		30-50
Readiness Office		3	9:15	72.9		58.2		503		0.2		66-240		30-50
Supply Office		3	9:15	74.9		57.8		595		0.1		12-94	X	30-50
Gym		2	9:22	77.4		60.8	X	490		0.1		60-108		30
Custodial Room		1	9:23									15	X	30
Shower Room		3	9:25	77.8		60.2	X	449		0.1		3-22	X	5
Outside			10:20	79.7		70.1		328		1.1				

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, Connecticut 03079

INDUSTRIAL HYGIENE SURVEY REPORT
NEW HAVEN ARMORY
NEW HAVEN, CONNECTICUT

September 2006
PN: 39741509

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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TABLE OF CONTENTS

Section **Page**

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 390 of 1092

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TABLE OF CONTENTS (Cont)

APPENDICES

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FOIA Requested Record #J-15-0085 (CT)
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Page 391 of 1092

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate.	Increase illumination through use of task lighting. (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in wipe samples collected from the firing range, drill hall and the administrative area in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 3
Asbestos		
Damaged presumed asbestos-containing pipe insulation was observed in the boiler room.	Remove and replace damaged asbestos-containing materials. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
A site specific asbestos operations and maintenance plan available, however there were no training records available and labeling of installed asbestos-containing materials has not been completed.	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j)	RAC 4
Hazard Communication		
A site specific hazard communication plan was not available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the New Haven Armory located at 290 Goffe Street in New Haven, Connecticut 06511. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On August 11, 2005, Ms Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in New Haven, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Ms. Non-Responsive site contact for this survey.

The armory is a four-story brick and mortar building, with a flat, asphalt roof. This facility contains an attached drill hall and a vacant apartment. The building was constructed about 1930. A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 393 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning workstations at the time of this survey.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the 1st floor hallway, 2nd floor drill hall, 3rd floor hallway, and outside. These readings were all made using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 50.8-51.9% throughout the various building areas with an average of 51.4%. The average reading was below the recommended upper limit of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from 435 to 497 parts per million (ppm), with an average of 470 ppm. The outside reading was 417 ppm.

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 394 of 1092

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problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 417 ppm on the day of the survey, the ASHRAE limit would be 1,117 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations were measured at 3 ppm throughout the building, on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting).

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 395 of 1092

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (foot candles)	Recommended Lighting (foot candles)
Room 208	Administrative Area	<1	50
Room 208A	Administrative Area	<1	50
Room 109	General Work Area – Cafeteria	52	30
Room 109A	General Work Area – Kitchen	60	30
Room 213	Administrative Area	9	50
Room 213A	Administrative Area	12	50
Room 213B	Administrative Area	30	50
Room 215	Administrative Area	17	50
Room 216	Administrative Area	13	50
Room 216A	Administrative Area	30	50
Room 216D	Administrative Area	59	50
Room 217	Administrative Area	20	50
Room 217A	Administrative Area	47	50
Room 217B	Administrative Area	26	50
Room 219	Administrative Area	20	50
Room 300	Administrative Area	24	50
Room 304	Administrative Area	19	50
Room 305	Administrative Area	13	50
Room 307	Administrative Area	123	50
Room 307A	Administrative Area	<1	50
Room 312	General Work Area – Gymnasium	25	30
Room 313	Administrative Area	28	50
Room 313A	Administrative Area	37	50
Room 313B	Administrative Area	47	50
Room 313C	Administrative Area	30	50
Room 313D	Administrative Area	39	50

On the day of the survey lighting in most administrative areas was inadequate.

2.2.5 Lead

Paint chips were collected in five areas where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. The five samples were found to contain lead in a concentration below the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 396 of 1092

Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the lead paint testing.

Table 2-2
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Room 309A-Ceiling	PNT-01	0.01	0.066
4th Floor-Backroom	PNT-02	0.01	0.28
Ground Floor-Parking	PNT-03	0.01	0.016
Ground Floor-Entry	PNT-04	0.01	0.11
Room 208-Wall	PNT-05	0.01	0.22

Sample numbers and locations can be found on the site map in appendix A.

The analytical report from AMA is contained in Appendix D.

Wipe testing for lead dust was conducted in the administration areas using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 2-3 below shows the results of the lead sampling.

Table 2-3
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Room #313C-Sill	RWS-01	10x10 cm	78	200
Room #300-Sill	RWS-02	10x10 cm	73	200
Room #307A-Tabletop	RWS-03	10x10 cm	110	200
Room #208-Sill	RWS-04	10x10 cm	400	200
Room #200D-Sill	RWS-05	10x10 cm	110	200
Room #217-Cabinet	RWS-06	10x10 cm	5.3	200
Room #207B-Stairs	RWS-07	10x10 cm	17	200
Room #213-Cabinet	RWS-08	10x10 cm	16	200
Room #108C-Sill	RWS-09	10x10 cm	680	200
Ground Floor-Cage Hall	RWS-10	10x10 cm	750	200
Club Room-Floor	RWS-11	10x10 cm	46	200

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 397 of 1092

2.2.6 Asbestos

Damaged plaster and flooring materials (tile and sheet flooring) were observed throughout administrative area. These materials must be presumed to be asbestos-containing until bulk sampling can rebut that presumption. Bulk samples of damaged suspect asbestos-containing materials (ACM) were not collected per Lt. Non-Responsive. According to Lt. Non-Responsive an ACM inspection had been conducted prior to URS' survey.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in approximately 90% of the offices and generally throughout the facility. Employees are not permitted to use the lights when the air conditioning is operating due to a power shortage. URS recommends increasing the area lighting or supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: Dust wipes collected in the window sills of room 208 and 108C were found to contain lead at levels above the 200 microgram per square foot limit set by the NGB Region North Industrial Hygiene Office (see Appendix G). URS recommends that all

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 398 of 1092

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window sills be cleaned by personnel trained in accordance with the OSHA Lead standard (29 CFR 1910.1025 and 1926.62). A dust wipe sample collected on the ground floor at the cage hall was also above 200 micrograms per square foot and should also be cleaned by personnel trained in accordance with the OSHA lead standard.

ASBESTOS: Damaged plaster and flooring materials (tile and sheet flooring) were observed throughout administrative area. These materials must be presumed asbestos-containing until bulk sampling can rebut presumption. Damaged asbestos-containing material should be either removed or repaired to prevent asbestos fibers from becoming airborne. Asbestos abatement should be performed using approved methods in accordance with applicable regulations established by the EPA, OSHA and the State of Connecticut. Any asbestos abatement activities must be conducted by a licensed asbestos abatement contractor.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 399 of 1092

3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now used as a Supply Room. This area has a workstation for the Supply Sergeant.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead dust was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Indoor Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Top of Lockers	FR-06	0.108	560	200
Shelving	FR-07	0.108	32	200
Floor	FR-08	0.108	350	200
Floor	FR-09	0.108	290	200
Television Sitting Area	FR-10	0.108	56	200

Sample numbers and locations can be found on the site map in Appendix A.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 400 of 1092

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3.6 Interpretation of Results

LEAD: Wipe samples collected from the former indoor firing range for lead were found to be above allowable limits and require cleaning. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Guidelines for the cleanup and rehabilitation of former indoor firing ranges is provided in Appendix H.

ERGONOMICS: The work station belonging to the Supply Sergeant is poorly configured from an ergonomic perspective. The desk, chair and monitor need to be corrected by fitting the workplace to the worker.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 401 of 1092

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,000 square foot area with about a 30-foot high ceiling used for parking and assembling personnel. The walls are constructed of brick and mortar with a wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Top of Lockers	DH-01	0.108	610	200
Floor	DH-02	0.108	250	200
Floor	DH-03	0.108	87	200
Heater	DH-04	0.108	7100	200
Tabletop	DH-05	0.108	100	200

Sample numbers and locations can be found on the site map in Appendix A.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 402 of 1092

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4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be above allowable limits and require cleaning. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 403 of 1092

5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

5.2.1 Asbestos

Damaged suspect asbestos-containing thermal system insulation was observed in the boiler room. Per Lt. Non-Responsive, the material was not tested for asbestos content. According to Lt. Non-Responsive, an ACM inspection had been conducted prior to URS' survey.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

ASBESTOS: Damaged presumed asbestos-containing material in the form of pipe insulation was observed in the boiler room. This material should be either removed or repaired to prevent asbestos fibers from becoming airborne. Asbestos abatement should be performed using approved methods in accordance with applicable regulations established by the EPA, OSHA and the State of Connecticut. Any asbestos abatement activities must be conducted by a licensed asbestos abatement contractor.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 404 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

No program was found regarding hazard communication. Training records are maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 405 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

Standard for Construction Industry 29 CFR 1926

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Page 406 of 1092

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APPENDIX A

ARMORY DRAWING

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FOIA Requested Record #J-15-0085 (CT)
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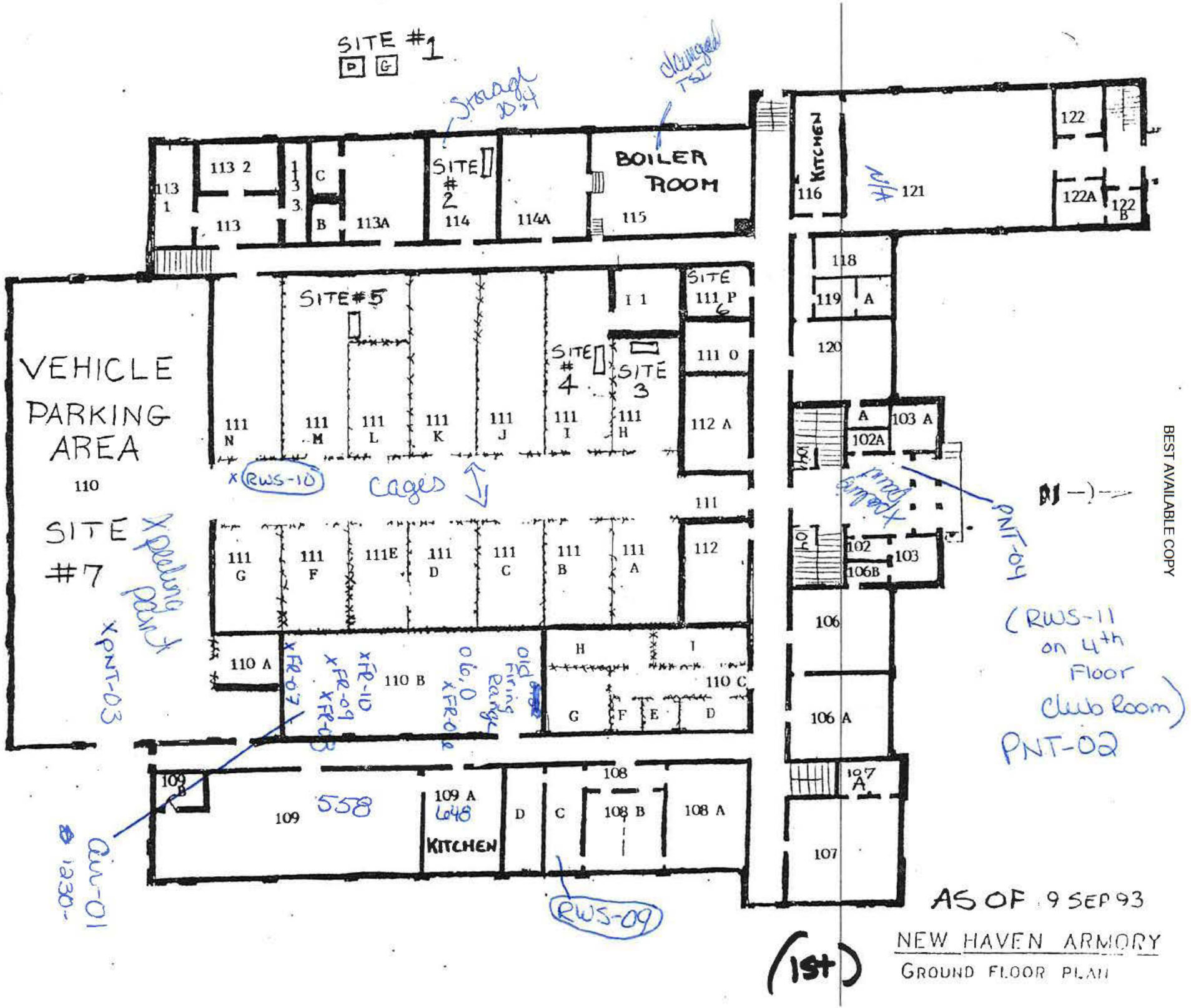
Page 407 of 1092



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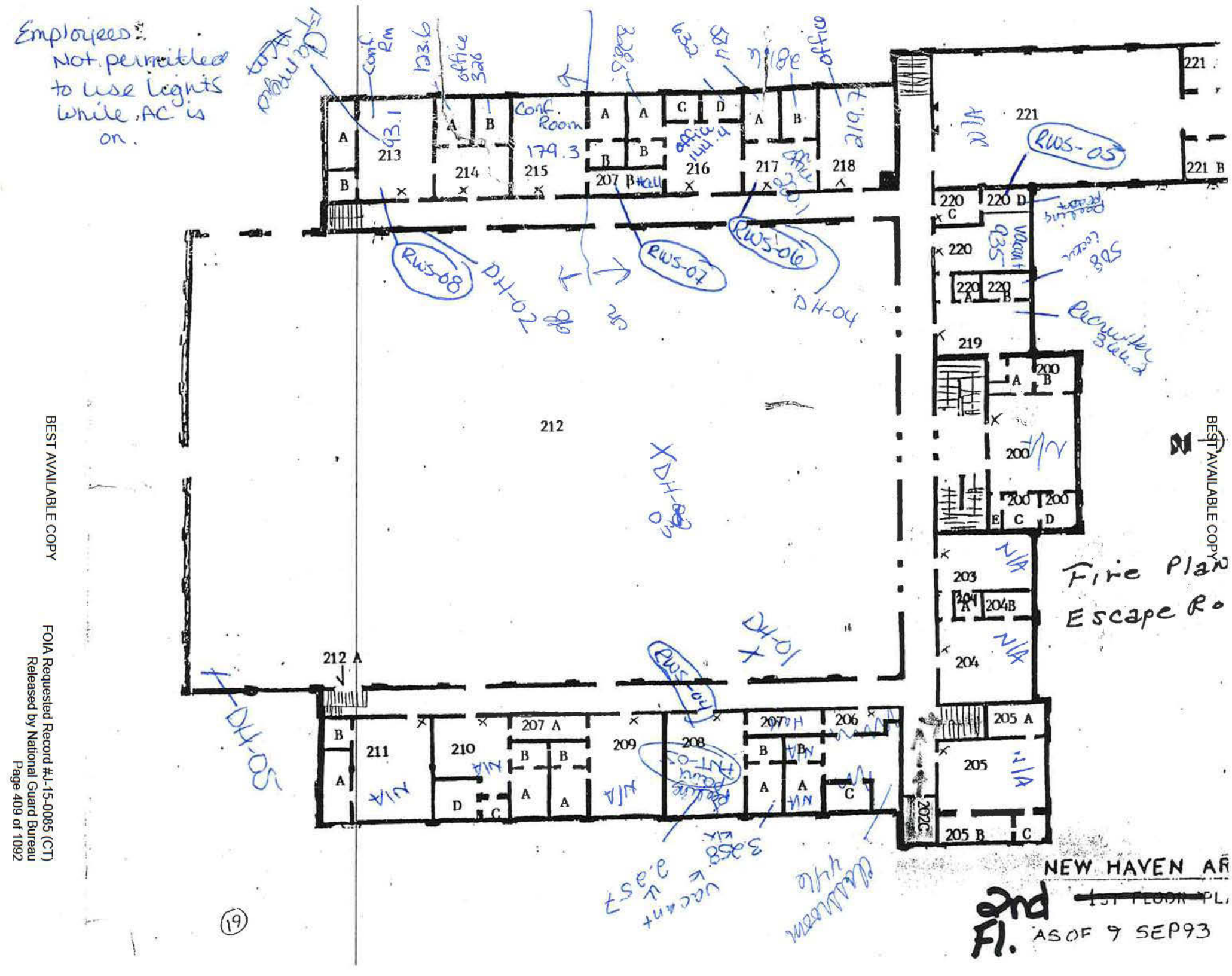
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 408 of 1092



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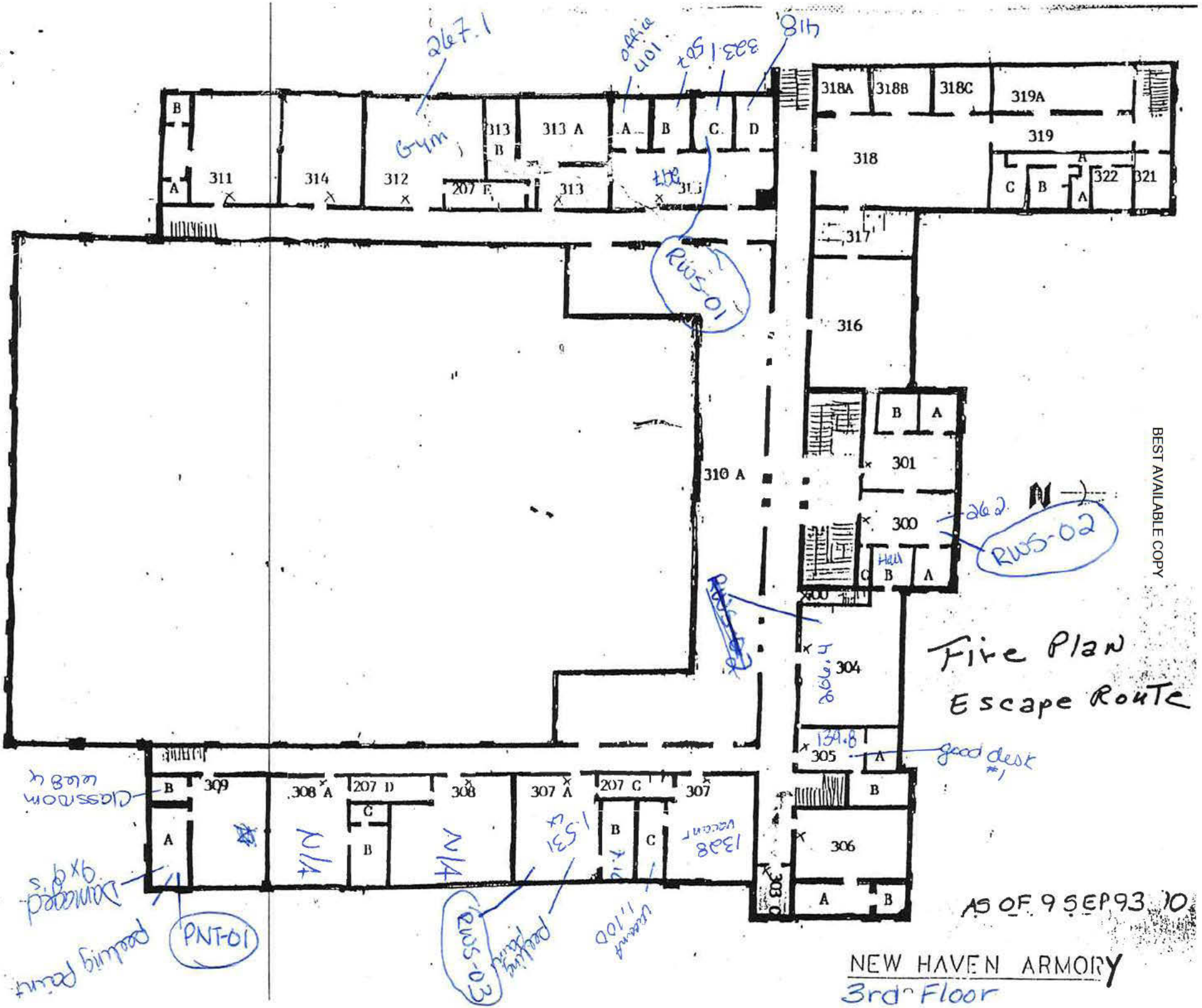
Page 409 of 1092



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FOIA Requested Record #J-15-0085 (CT)
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Page 410 of 1092
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APPENDIX B

PERSONNEL LIST

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PERSONEL LIST
NEW HAVEN ARMORY

Name	Rank
Non-Responsive	CPT
	CPT
	SGM
	SFC
	SGT
	SFC
	SFC
	CPT
	CPT
	MSG
	SFC
	SFC
	SFC
	SSG
	SSG
	SFC
	SFC
	SSG
	SSG
	SGT
	SGT

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APPENDIX D

ANALYTICAL RESULTS

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Page 414 of 1092

01/19/2006 15:03 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.539 001

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	147709
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SJ, State Military Reservation	**Job Location:**	New Haven CT	**Date Submitted:**	1/16/06
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	1/19/06
Attention:	[redacted]				

Report Date: 19-Jan-06

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0620323	DH-01	Furnace	Wipe	****	0.108	69.70	ug/ft²	610	ug/ft²	
0620324	DH-02	Furnace	Wipe	****	0.108	69.70	ug/ft²	250	ug/ft²	
0620325	DH-03	Furnace	Wipe	****	0.108	69.70	ug/ft²	87	ug/ft²	
0620326	DH-04	Furnace	Wipe	****	0.108	1742.57	ug/ft²	7100	ug/ft²	
0620327	DH-05	Furnace	Wipe	****	0.108	69.70	ug/ft²	100	ug/ft²	
0620328	FR-06	Furnace	Wipe	****	0.108	69.70	ug/ft²	560	ug/ft²	
0620329	FR-07	Furnace	Wipe	****	0.108	13.94	ug/ft²	32	ug/ft²	
0620330	FR-08	Furnace	Wipe	****	0.108	69.70	ug/ft²	350	ug/ft²	
0620331	FR-09	Furnace	Wipe	****	0.108	69.70	ug/ft²	290	ug/ft²	
0620332	FR-10	Furnace	Wipe	****	0.108	13.94	ug/ft²	56	ug/ft²	
0620333	RWS-01	Furnace	Wipe	****	0.108	69.70	ug/ft²	78	ug/ft²	
0620334	RWS-02	Furnace	Wipe	****	0.108	69.70	ug/ft²	73	ug/ft²	
0620335	RWS-03	Furnace	Wipe	****	0.108	69.70	ug/ft²	110	ug/ft²	
0620336	RWS-04	Furnace	Wipe	****	0.108	69.70	ug/ft²	400	ug/ft²	
0620337	RWS-05	Furnace	Wipe	****	0.108	69.70	ug/ft²	110	ug/ft²	
0620338	RWS-06	Furnace	Wipe	****	0.108	2.79	ug/ft²	5.3	ug/ft²	
0620339	RWS-07	Furnace	Wipe	****	0.108	13.94	ug/ft²	47	ug/ft²	
0620340	RWS-08	Furnace	Wipe	****	0.108	2.79	ug/ft²	16	ug/ft²	
0620341	RWS-09	Furnace	Wipe	****	0.108	69.70	ug/ft²	660	ug/ft²	
0620342	RWS-10	Furnace	Wipe	****	0.108	69.70	ug/ft²	250	ug/ft²	

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Page 15 of 15

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01/19/2006 13:43 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.539 002

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	147709
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	New Haven CT	**Date Submitted:**	1/16/06
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	1/19/06

Report Date: 19-Jan-06

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0620343	RWS-11	Furnace	Wipe	****	0.108	13.94	ug/ft²	46	ug/ft²	
0620344	PNT-01	Flame	Paint Chip	****	N/A	0.01	%Pb	0.066	%Pb	
0620345	PNT-02	Flame	Paint Chip	****	N/A	0.01	%Pb	0.28	%Pb	
0620346	PNT-03	Flame	Paint Chip	****	N/A	0.01	%Pb	0.016	%Pb	
0620347	PNT-04	Flame	Paint Chip	****	N/A	0.01	%Pb	0.11	%Pb	
0620348	PNT-05	Flame	Paint Chip	****	N/A	0.01	%Pb	0.22	%Pb	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] **Technical Manager:** [redacted]

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APPENDIX E

TRAINING CERTIFICATES

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May-26-05 01:17pm From-URS CORPORATION BEST AVAILABLE COPY T-317 P.02/02 F-076

CERTIFICATE OF ACHIEVEMENT

This certifies that

[redacted] Non-Responsive

has successfully completed the

Asbestos Site Inspector Refresher Training
Asbestos Accreditation Under TSCA Title II
40 CFR Part 763

conducted by

ATC Associates Inc.
73 William Franks Drive
West Springfield, MA 01089
(413) 781-0070

[redacted] Non-Responsive

May 26, 2005
Date of Course

May 26, 2006
Expiration Date

[redacted] Non-Responsive

SIAR-1938
Certificate Number

May 26, 2005
Examination Date

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Page 418 of 1092

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APPENDIX F

PHOTOGRAPHS

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Page 419 of 1092

Photo 1:
Drill Hall Layout

Photo 2:
3rd Floor Restroom-Damaged Plaster Ceiling

Photo 3:
4th Floor Restroom-Damaged Wall

Photo 4:
4th Floor Damaged ACM Flooring

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Photo 5:
3rd Floor Room 309B-Damaged ACM Floor Tile

Photo 6:
3rd Floor Room 309B-Peeling Paint

Photo 7:
3rd Floor Room 305-Proper Desk Setup

Photo 8:
2nd Floor Room 215-Damaged Suspect ACM Flooring

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Photo 9:
2nd Floor Room 213-Damaged Suspect ACM Flooring

Photo 11:
Boiler Room-Damaged Pipe Insulation

Photo 10:
Boiler Room-Damaged Pipe Insulation

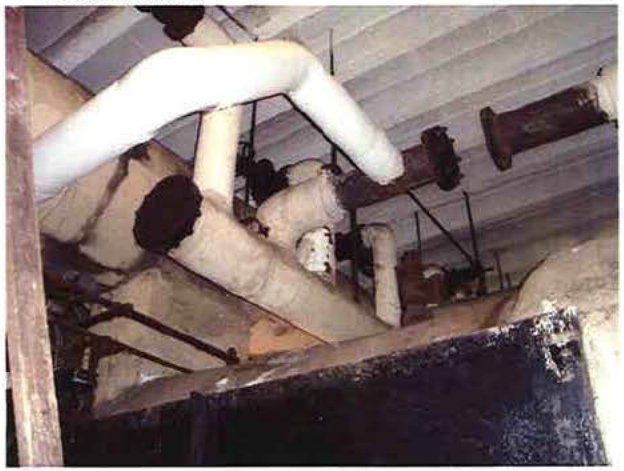

Photo 12:
Boiler Room-Damaged Pipe Insulation

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Photo 13:
Storage Room 110B-Former Firing Range

Photo 15:
Ground Floor Vehicle Parking Area-Peeling Paint

Photo 14:
Storage Room 110B-Former Firing Range-Work Station

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building,

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15 30 DECEMBER 2002)

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 427 of 1092

BEST AVAILABLE COPY

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
- a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
- b. AR 11-34 (The Army Respiratory Protection Program).
- c. AR 40-5 (Preventive Medicine).
- d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
- e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
- f. OSHA Technical Manual, Edition VII.
- g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 428 of 1092

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3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman ™ #10 paper.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 429 of 1092

BEST AVAILABLE COPY

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 430 of 1092

BEST AVAILABLE COPY

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 431 of 1092

BEST AVAILABLE COPY

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 432 of 1092

BEST AVAILABLE COPY

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 433 of 1092

BEST AVAILABLE COPY

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insuro that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 434 of 1092

BEST AVAILABLE COPY

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 435 of 1092

BEST AVAILABLE COPY

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 436 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

BEST AVAILABLE COPY

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 437 of 1092

BEST AVAILABLE COPY

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address		Point of Contact *(name & phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			
Sampling Data			

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 438 of 1092

BEST AVAILABLE COPY

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

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FOIA Requested Record #J-15-0085 (CT)
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Page 439 of 1092

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APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 440 of 1092

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APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

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FOIA Requested Record #J-15-0085 (CT)
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Page 441 of 1092

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
NEW LONDON ARMORY
NEW LONDON, CONNECTICUT

July 2006
PN: 39741509

Non-Responsive

Office Manager

Non-Responsive

Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 442 of 1092

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TABLE OF CONTENTS

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 443 of 1092

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TABLE OF CONTENTS (Cont)

APPENDICES

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 444 of 1092

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer workstations were observed with chairs with fixed armrests.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (Department of the Army Pamphlet 40-21, Chapter 4, Page 7, Section 4-3)	RAC 3
Lead		
Lead was detected in wipe samples collected from the facility in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025 (e)(1)(i))	RAC 3
Asbestos		
A site-specific asbestos operations and maintenance plan was available. No warning labels in janitorial or maintenance areas.	Maintain a site specific asbestos operations and maintenance plan to manage asbestos-containing materials by labeling of asbestos (OSHA 29 CFR 1910.1001 (j)(4)); employee information and training (OSHA 29 CFR 1910.1001 (j)(7)); housekeeping (OSHA 29 CFR 1910.1001 (k)); medical surveillance (OSHA 29 CFR 1910.1001 (l)(1)); record keeping (OSHA 29 CFR 1910.1001 (m)(1))	RAC 3
Hazard Communication		
Training records not available on site.	CT ARNG must provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and material safety data sheets (29 CFR 1910.1200 (h))	RAC 4

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 445 of 1092

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the New London Armory located at 249 Bayonet Street in New London, Connecticut 06320. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On August 19, 2005, Ms. Non-Responsive an industrial hygienist with URS, conducted a site visit at the Armory in New London, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lt. Non-Responsive of the Connecticut ARNG was Ms. Non-Responsive site contact for this survey.

This armory is a single story brick building, with an attached drill hall that is constructed primarily of brick and mortar. This facility is built on a concrete slab and has a flat asphalt roof. A layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 446 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Some computer workstations had chairs where the armrests were in a fixed position. If more than one person is using that workstation, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning workstations at the time of this survey.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the drill hall, the orderly room, and outside. These readings were all made using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 47.4-51.2 % throughout the various building areas with an average of 49.3%. The average reading was below the recommended maximum level of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004). The outside relative humidity reading was 44.3%.

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from a low of 481 to a spike of 1111 parts per million (ppm), with an average of 796 ppm. The outside reading was 381 ppm.

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 447 of 1092

effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants. ASHRAE recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 381 ppm on the day of the survey, the ASHRAE limit would be 1,081 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations were below detectable limits on the day of the survey. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative areas was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI / IESNA RP–1-04 American National Standard Practice for Office Lighting).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 448 of 1092

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (foot candles)	Recommended Lighting (foot candles)
Room #17	Administrative Duties	36	50
Room #15	Administrative Duties	32	50
Room #12A	Administrative Duties	51	50
Room #10	Administrative Duties	46	50
Room #7	Administrative Duties	38	50
Room #5	Administrative Duties	54	50
Kitchen	General Work Area	52	30
Supply Room	Indoor Rack Storage	11	10

On the day of the survey approximately half of the offices had lighting levels which were below the recommended foot candles for this type of work.

2.2.5 Lead

Wipe testing for lead was conducted in the administrative area using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 2-2 below shows the results of the lead sampling.

Table 2-2
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Room #12-Sill	RWS-1	16 in^2	120	200
Room #21-Floor	RWS-2	16 in^2	6.7	200
Room #14-Counter	RWS-3	16 in^2	<2.8	200
Room #34-Floor	RWS-4	16 in^2	6.4	200
Blank	Blank 1	N/A	<0.3 µg	N/A

Sample numbers and locations can be found on the site map in appendix A.

2.3 Ventilation System Evaluation

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 449 of 1092

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2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The observed ergonomic issues were minor with the chairs and should be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in most measured offices. While work is in progress the administrative area must be lighted by at least the minimum recommended light intensities.

LEAD: All dust wipe samples collected from the administrative area were found to contain lead levels below 200 micrograms/ square foot. This is the level recommended by the NGB Region North Industrial Hygiene Office (appendix G).

HAZARD COMMUNICATION: A chemical inventory sheet was not available during the site visit. MSDS's were observed during the site visit.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 450 of 1092

3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now primarily used for storage and as a food prep area.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Indoor Firing Range-Trap Table	FR-06	16 in^2	82	200
Indoor Firing Range-Trap Floor	FR-07	16 in^2	3100	200
Indoor Firing Range-Flammable Cabinet	FR-08	16 in^2	900	200
Indoor Firing Range-Desk	FR-09	16 in^2	24	200
Indoor Firing Range-Kitchen Service Line	FR-10	16 in^2	26	200
Blank	Blank 1	N/A	<0.3 μg	N/A

Sample numbers and locations can be found on the site map in appendix A.

3.3 Ventilation System Evaluation

Not applicable to this operation

3.4 Noise Measurements

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 451 of 1092

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3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Two surfaces tested for lead in the former firing range were found to contain lead above 200 micrograms per square foot ($\mu g/ft^2$). The NGB Region North Industrial Hygiene Office recommends that lead in dust not exceed 200 $\mu g/ft^2$. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. The U.S. Occupational Safety and Health Administration (OSHA) regulations, 29 CFR 1910.1025 and 29 CFR 1926.62 are designed to protect workers potentially exposed to elevated airborne levels of lead. Guidelines for the cleanup and rehabilitation of indoor firing ranges are provided in Appendix H.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 452 of 1092

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 6,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall-Floor	DH-01	16 in^2	39	200
Drill Hall-Fire Box	DH-02	16 in^2	56	200
Drill Hall-Floor	DH-03	16 in^2	8	200
Drill Hall-Sign In Box	DH-04	16 in^2	21	200
Drill Hall-Couch	DH-05	16 in^2	100	200
Blank	Blank 1	N/A	<0.3 µg	N/A

Sample numbers and locations can be found on the site map in Appendix A.

4.3 Ventilation System Evaluation

Not applicable to this operation

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 453 of 1092

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4.6 Interpretation of Results

LEAD: All dust wipe samples collected from the administrative area were below 200 micrograms/ square foot. This is the level recommended by the NGB Region North Industrial Hygiene Office (Appendix G).

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 454 of 1092

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5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

No chemical or physical agents were sampled in this area.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

Not applicable to this operation.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 455 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

Though MSDS's were found on site, a site-specific hazard communication program was not found. Training records were not found on site. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 456 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities for Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15, 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 457 of 1092

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APPENDIX A

ARMORY DRAWING

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APPENDIX B

PERSONNEL LIST

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Released by National Guard Bureau
Page 460 of 1092

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APPENDIX C

HAZARDOUS MATERIALS LIST

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Page 462 of 1092

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APPENDIX D

ANALYTICAL RESULTS

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Page 464 of 1092

01/19/2006 08:58 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.538 P03

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	147708
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	New London CT	**Date Submitted:**	1/16/2006
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	1/19/2006

Report Date: 19-Jan-06

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0620308	DH-01	Furnace	Wipe	****	0.108	13.94	ug/ft²	39	ug/ft²	
0620309	DH-02	Furnace	Wipe	****	0.108	13.94	ug/ft²	56	ug/ft²	
0620310	DH-03	Furnace	Wipe	****	0.108	2.79	ug/ft²	8	ug/ft²	
0620311	DH-04	Furnace	Wipe	****	0.108	2.79	ug/ft²	21	ug/ft²	
0620312	DH-05	Furnace	Wipe	****	0.108	69.70	ug/ft²	100	ug/ft²	
0620313	FR-06	Furnace	Wipe	****	0.108	69.70	ug/ft²	82	ug/ft²	
0620314	FR-07	Furnace	Wipe	****	0.108	697.03	ug/ft²	3100	ug/ft²	
0620315	FR-08	Furnace	Wipe	****	0.108	697.03	ug/ft²	900	ug/ft²	
0620316	FR-09	Furnace	Wipe	****	0.108	2.79	ug/ft²	24	ug/ft²	
0620317	FR-10	Furnace	Wipe	****	0.108	2.79	ug/ft²	26	ug/ft²	
0620318	BLANK-1	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0620319	RWS-01	Furnace	Wipe	****	0.108	69.70	ug/ft²	120	ug/ft²	
0620320	RWS-02	Furnace	Wipe	****	0.108	2.79	ug/ft²	6.7	ug/ft²	
0620321	RWS-03	Furnace	Wipe	****	0.108	2.79	ug/ft²	< 2.8	ug/ft²	
0620322	RWS-04	Furnace	Wipe	****	0.108	2.79	ug/ft²	6.4	ug/ft²	

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FOIA Requested Record #J-15-0085 (Part)
Released by National Guard Bureau
Page 465 of 1022

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01/19/2006 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.538 004

AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	147708
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	New London CT	**Date Submitted:**	1/16/2006
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	1/19/2006
Attention:	[redacted]			**Report Date:**	19-Jan-06

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: [redacted] Technical Manager: [redacted]

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Page 1 of 1

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APPENDIX E

TRAINING CERTIFICATES

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Page 467 of 1092

May-26-05 01:17pm From-URS CORPORATION BEST AVAILABLE COPY T-317 P.02/02 F-076

CERTIFICATE OF ACHIEVEMENT

This certifies that

[redacted] Non-Responsive

has successfully completed the

Asbestos Site Inspector Refresher Training
Asbestos Accreditation Under TSCA Title II
40 CFR Part 763

conducted by

ATC Associates Inc.
73 William Franks Drive
West Springfield, MA 01089
(413) 781-0070

[redacted] Non-Responsive
Principal Instructor

May 26, 2005
Date of Course

May 26, 2006
Expiration Date

[redacted] Non-Responsive
Regional Manager

SIAR-1938
Certificate Number

May 26, 2005
Examination Date

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Page 468 of 1092

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APPENDIX F

PHOTOGRAPHS

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FOIA Requested Record #J-15-0085 (CT)
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Page 469 of 1092

Photo 1:
Exterior

Photo 2:
Drill Hall-Layout

Photo 3:
Orderly Room-Unadjustable Chair

Photo 4:
Custodian Closet-Chemical Storage

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Photo 5:
Kitchen-Suspect ACM Floor Tiles in Good Condition

Photo 6:
Locker Room-Suspect ACM Pipe Fittings In Good Condition

Photo 7:
Locker Room-Suspect ACM Floor Tiles in Good Condition

Photo 8:
Storage Area-Former Firing Range

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15, 30 DECEMBER 2002)

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FOIA Requested Record #J-15-0085 (CT)
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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 476 of 1092

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3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman ™ #40 paper

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 477 of 1092

BEST AVAILABLE COPY

(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 478 of 1092

BEST AVAILABLE COPY

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 479 of 1092

BEST AVAILABLE COPY

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 480 of 1092

BEST AVAILABLE COPY

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 481 of 1092

BEST AVAILABLE COPY

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 482 of 1092

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APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 483 of 1092

BEST AVAILABLE COPY

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 484 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 485 of 1092

BEST AVAILABLE COPY

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address			Point of Contact *(name & phone #)* Samples Collected By
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			

Sampling Data

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 486 of 1092

BEST AVAILABLE COPY

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 487 of 1092

BEST AVAILABLE COPY

APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

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FOIA Requested Record #J-15-0085 (CT)
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Page 488 of 1092

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APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 489 of 1092

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Industrial Hygiene Survey

Connecticut Army National Guard (CT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

New London Readiness Center
249 Bayonet Street
New London, CT 06320

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: August 29, 2012

AEI Project #: J12-676 3h CT New London RC

_____

Non-Responsive, **CIH, CSP, LEED Green Associate**
Industrial Hygienist

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 490 of 1092

Table of Contents

List of Tables and Appendices

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 491 of 1092

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) New London Readiness Center located at 249 Bayonet Street, New London, CT 06320. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 29, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in several areas of the Boiler Room. Paint chip samples were collected and submitted for lead analysis. The paint chip samples were below 0.5% lead by weight and are not considered lead-based paint. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot ($\mu g/ft^2$)) in all areas sampled except for two samples collected from the former firing range floor. Surfaces contaminated with lead dust should be cleaned using wet methods or high efficiency particulate air (HEPA)-filtered vacuums.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged pipe wrap was observed in custodian closet #6, damaged plaster was observed in the Boiler Room and a damaged hard elbow of pipe insulation was observed in Room #25. Samples of these materials were collected and submitted for asbestos analysis. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. No asbestos was detected in the samples.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. A small stain that appeared to be mold was observed on the wall at the entrance of the building. Standing water, rust, concrete efflorescence and peeling paint were observed in the Boiler Room. Several stained ceiling tiles were observed throughout the building. Water intrusion can lead to mold growth and/or deterioration and damage of building materials. The Army Public Health Command's Technical Guide 277, Army Facilities Management Information Document on Mold Remediation Issues, February 2002, addresses water damage and mold prevention.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas mostly due to burned out or missing light bulbs. The illumination measurements indoors ranged from 4 foot candles (fc) to 188 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly acceptable compared to the comfort ranges for the summer season on the day of the survey. The outdoor

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 492 of 1092

temperature and relative humidity were 73.7° F and 38.9% on the day of monitoring, and indoor conditions were similar to outdoor conditions. The facility has air-conditioning in some areas. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide were below the recommended concentrations in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available as required by the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200; however, MSDSs were readily available and up to date. It is recommended that the written hazard communication program be placed in every MSDS notebook along with any related training records.

Overall, the New London Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 493 of 1092

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) New London Readiness Center located at 249 Bayonet Street, New London, CT 06320 Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 29, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The New London Readiness Center was built in 1950's. The readiness center is staffed by 6 National Guard administrative personnel and one 1 civilian caretaker (maintainer). The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the New London Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the New London facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state employed maintainer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 494 of 1092

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for damaged building materials that may contain asbestos or lead-based paint, for water damage or mold problems; for potential ergonomic problems; and for housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in the Boiler Room. Paint chip samples were collected and submitted for lead analysis. Results are given in Table 1 and certificates of analysis are included in Appendix B. The paint chip samples were below 0.5% lead by weight and are not considered lead-based paint.

Table 1 – Results of Paint Chip Sampling for CTARNG New London Readiness Center on August 29, 2012.

Sample #	Sample Location	Lead Result (% by wt)
NL-Bulk-02	From the Boiler Entrance (electrical room) at the cove base line	0.033
NL-Bulk-03	From the exit door jamb in the Boiler room	0.31
NL-Bulk-04	From the Boiler Room at the cove base line	0.035
NL-Bulk-06	Red floor paint in the Boiler Room	0.16
NL-Bulk-07	Paint from around the window in the Boiler Room (from CMU)	0.027
NL-Bulk-08	Painted conduit housing below electrical box in Boiler Room	0.093

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the state of Connecticut limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical Services, Inc. (AMA) of Lanham, MD for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Wipe samples collected from the facility were below the recommended maximum level for surface contamination in all areas except for two samples collected from the floor in the former firing range. Surfaces contaminated with lead dust should be cleaned using wet methods or high efficiency particulate air (HEPA)-filtered vacuums. Results are given in Table 2 and certificates of analysis are included in Appendix B.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 495 of 1092

Table 2 – Results of Dust Wipe Sampling for CTARNG New London Readiness Center on August 29, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
NL-W01	Drill Hall – floor near Men's latrine	<110
NL-W02	Drill Hall – top of amnesty box	<110
NL-W03	Drill Hall – floor near bay door	<110
NL-W04	Drill Hall – floor in one corner	120
NL-W05	Drill Hall – serving counter	<110
NL-W06	Kitchenette – table top	<110
NL-W07	Kitchen – prep table	<110
NL-W08	Dining Room – table	<110
NL-W09	Dining Room – floor	<110
NL-W10	Fitness Center – floor mat	<110
NL-W11	Storage area (Former Firing Range)- dusty shelf	<110
NL-W12	Storage area (Former Firing Range)- floor unpainted concrete	**210**
NL-W13	Storage area (Former Firing Range)- floor red painted concrete	**210**

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft^2) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged pipe wrap was observed in custodian closet #6, damaged plaster was observed in the Boiler Room and a damaged hard elbow of pipe insulation was observed in Room #25. Samples of these materials were submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. No asbestos was detected in the samples.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. A small stain that appeared to be mold was observed on the wall at the entrance of the building. Standing water, rust, concrete efflorescence and peeling paint was observed in the Boiler Room. Several stained ceiling tiles were observed throughout the building. Water intrusion can lead to mold growth and/or deterioration and damage of building materials. The Army Public Health Command's Technical Guide 277, Army Facilities Management Information Document on Mold Remediation Issues, February 2002, addresses water damage and mold prevention.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 496 of 1092

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable with room for improvement.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas mostly due to burned out or missing light bulbs. The illumination measurements indoors ranged from 4 foot candles (fc) to 188 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 3. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 3 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 70.1 to 81.9° F and 38.6 to 56.9% Rh. Temperatures and relative humidity measurements were mostly within the comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 73.7° F and 38.9%, and conditions inside were similar to the outdoor conditions. This readiness center has air-conditioning units in some areas.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 497 of 1092

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 300 to 635 parts per million (ppm). The outdoor CO_2 concentration was 295 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.1 to 1.0 ppm; therefore all measurements were below the concentrations of concern.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available as required by the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200; however, MSDSs were readily available and up to date. It is recommended that the written hazard communication program be placed in every MSDS notebook along with any related training records.

7 Conclusions
The results of the evaluation indicated a few minor concerns at the facility. Overall, the New London Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations
This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 498 of 1092

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9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 499 of 1092

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Appendix A
Building Layout

FOIA Requested Record #J-15-0085 (CT)
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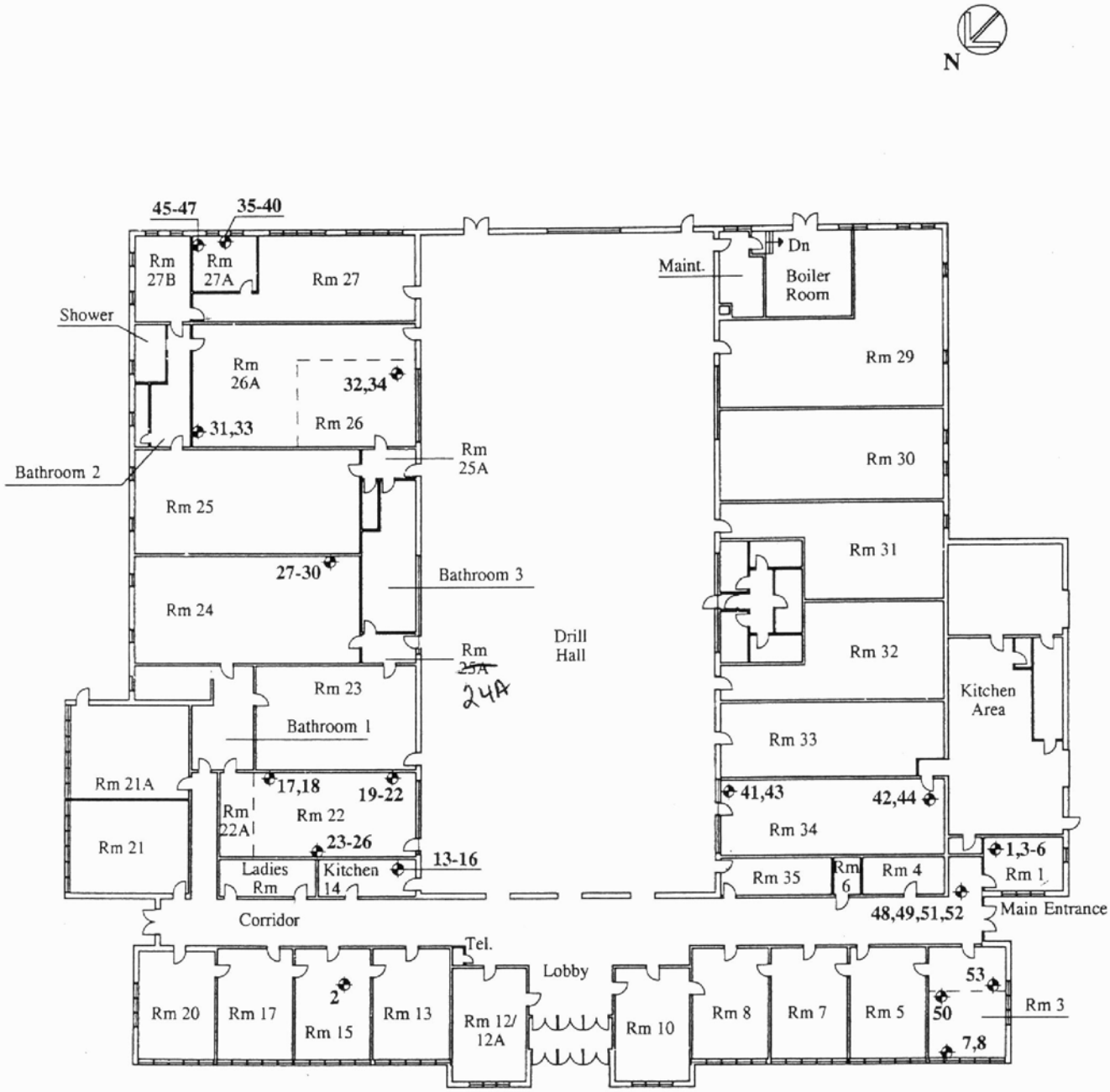

Legend :

◆ = Sample Number & Location

Drawing Title: **Asbestos Bulk Sample Location Diagram**	
Prepared by: EnviroMed Services, Inc. 470 Murdock Avenue, Box 13 Meriden, CT 06450	Date: 11/20,21/02
	Scale: N.T.S.
Project: **Military Department - New London Armory** Floor Plan New London, Connecticut	Drawn By: DER
	Approved By: S.S.
Prepared for : State of Connecticut Department of Public Works	Drawing No. 1 of 1

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Appendix B
Certificates of Analysis

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AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	New London RC	**Chain Of Custody:**	513851		
Address:	301-JH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	New London, CT	**Date Submitted:**	9/6/2012		
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/11/2012	**Report Date:**	9/11/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
12091607	NL-Bulk-02	Flame	Paint Chip	****	N/A	0.0077	%Pb		0.033	%Pb	
12091608	NL-Bulk-03	Flame	Paint Chip	****	N/A	0.0092	%Pb		0.31	%Pb	
12091609	NL-Bulk-04	Flame	Paint Chip	****	N/A	0.0083	%Pb		0.035	%Pb	
12091610	NL-Bulk-06	Flame	Paint Chip	****	N/A	0.0092	%Pb		0.16	%Pb	
12091611	NL-Bulk-07	Flame	Paint Chip	****	N/A	0.0084	%Pb		0.027	%Pb	
12091612	NL-Bulk-08	Flame	Paint Chip	****	N/A	0.011	%Pb		0.093	%Pb	
12091613	NL-W01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091614	NL-W02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091615	NL-W03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091616	NL-W04	Flame	Wipe	****	0.108	110	ug/ft²	12	120	ug/ft²	
12091617	NL-W05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091618	NL-W06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091619	NL-W07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091620	NL-W08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091621	NL-W09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091622	NL-W10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091623	NL-W11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091624	NL-W12	Flame	Wipe	****	0.108	110	ug/ft²	23	210	ug/ft²	
12091625	NL-W13	Flame	Wipe	****	0.108	110	ug/ft²	22	210	ug/ft²	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

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INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditation.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	New London RC	**Chain Of Custody:**	513851		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	New London, CT	**Date Submitted:**	9/6/2012		
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/11/2012	**Report Date:**	9/11/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results
Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: Non-Responsive

Technical Manager: Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	New London RC	**Chain Of Custody:**	513851
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	New London, CT	**Date Analyzed:**	9/11/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12091626	NL-Bulk-01	NAD	--	--	--	--	--	--	40	--	--	60	Wrap	White	Homogeneous	LBP	
12091627	NL-Bulk-05 PL	NAD	--	--	--	--	--	--	--	--	--	100	PL	White	Homogeneous	LBP	
12091628	NL-Bulk-05 BC	NAD	--	--	--	--	--	--	--	--	--	100	BC	Gray	Homogeneous	LBP	
12091629	NL-Bulk-09	NAD	--	--	--	--	25	--	--	--	--	75	PI	White	Homogeneous	LBP	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

NVLAP (101143-0) Accredited Laboratory
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FOIA Requested Record #J-15-0085 (CT)
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A Specialized Environmental Laboratory

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CERTIFICATE OF ANALYSIS

NVLAP
101143-0

Client:	National Guard Bureau	**Job Name:**	New London RC	**Chain Of Custody:**	513851
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	New London, CT	**Date Analyzed:**	9/11/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Direct Non-Responsive

Analyst(s) Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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OWI (410) 247-2024

New London

210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inqui

513851

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: New London RC
2. Job Location: New London, CT
3. Job #: J12-6216 P.O. #: W912K6-09-A-0003
4. Contact Person: Non-Responsive
5. Submitted by: Non-Responsive Signatu Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☒ 5 Day + Date Due: 9/13/12
☐ 2 Day
☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ Email: Non-Responsive @ariaenviro.com
☐ Fax: @us.army.mil
☐ Verl @us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)

PLM Bulk
☒ EPA 600 – Visual Estimate 3 (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)

MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)

TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
☒ Pb Paint Chip 6 (QTY)
☐ Pb Dust Wipe (wipe type 10x10) 13 (QTY)
☐ Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA

ANALYSIS

TEM	PCM	PLM	LEAD	MOLD

MATRIX

AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB

See Attached Sheets

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 9/10/12 @ MNS Via: FEDEX By (Print
2. Date/Time Analyz Non-Responsive By (Print): LOM
3. Results Reported ABLE COPY Via: Email
4. Comments:

Non-Responsive

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Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 8/29/12

Job Site: J12-676

Project No.: New London RC

Inspector: [redacted] Non-Responsive

Sample No.	Sample Type	Sample Location	Dimensions (Area)
NL-W01	Lead	Drill Hall - floor near men's latrine	10x10cm
NL-W02		Drill Hall - amnesty box	
NL-W03		Drill Hall - floor near bay door	
NL-W04		Drill Hall - floor (dusty corner)	
NL-W05		Drill Hall - serving counter to kitchenette	
NL-W06		Kitchenette - table top (prep area)	
NL-W07		Kitchen - prep table	
NL-W08		dining room - table	
NL-W09		Dining Room - floor	
NL-W10		fitness center - floor mat	
NL-W11	Case	former IFR - dusty shelf	
NL-W12	"	" - floor - concrete unpainted	
NL-W13	"	" - floor - Maintenance Concrete area (red paint deteriorated)	
NL-bulk-01 (asb)		- Janitors Closet (Room #6) pipe wrap	
NL-bulk-02 (lead)		- peeling paint electrical room cove area	
NL bulk-03 (lead)		peeling paint - boiler room door jamb	
NL bulk-04 (lead)		peeling paint boiler room cove base area	
NL bulk-05 (asb)		plaster on ceiling in Boiler room	
NL bulk-06 (lead)		red floor paint in Boiler Room	
NL bulk-07 (lead)		window (CMU) paint in Boiler Room	
NL bulk-08 (lead)		peeling paint on Conduit below elect. box in Boiler	
NL bulk-09 (asb)		mudded elbow pipe in room #25	

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Page 508 of 1092

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Appendix C
Photo Documentation

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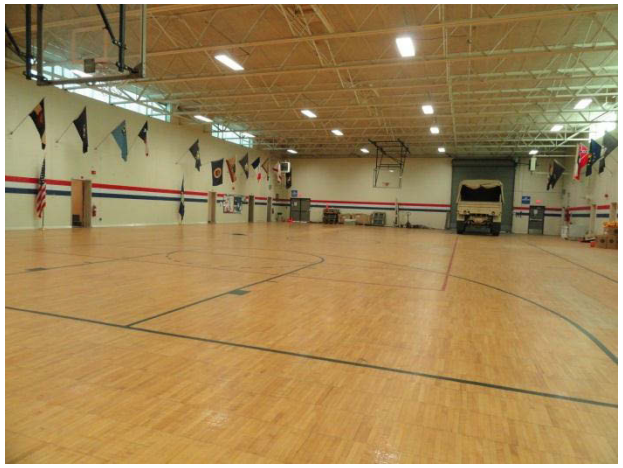
New London, CT Readiness Center



Drill Hall

Drill Hall

Buckied Parquet Floor in Drill Hall

Buckled Parquet Floor

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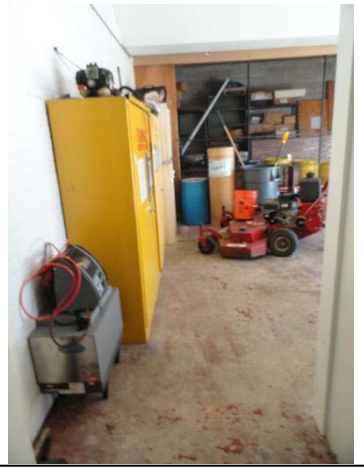
New London, CT Readiness Center

Damaged Parquet Floor



Lawn Maintenance Storage (Former Range)

Lawn Maintenance Storage (Former Range)

Storage (Former Range – remains of bullet trap on wall)

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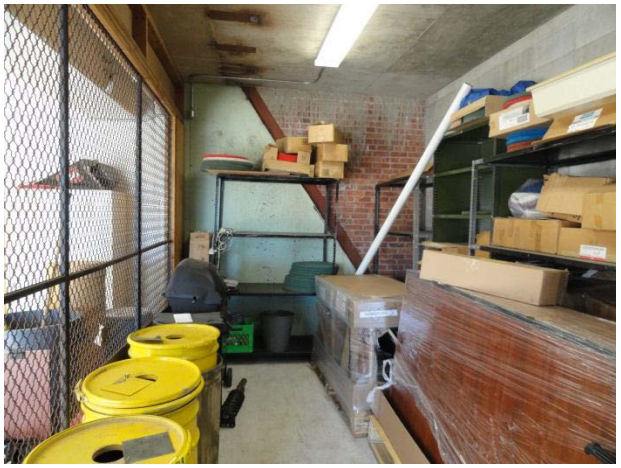
New London, CT Readiness Center

Remains of Bullet Trap on Ceiling



Storage (Former Range)

Boiler Room

Entrance to Boiler room

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New London, CT Readiness Center

Drill Hall

Mold on Wall

Serving Area of Kitchen

Kitchen

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New London, CT Readiness Center

Kitchen

Kitchen

Flammable Storage

Flammable Storage

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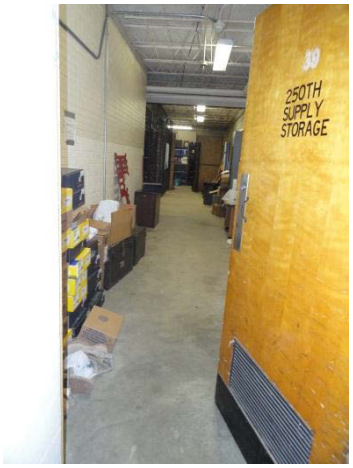
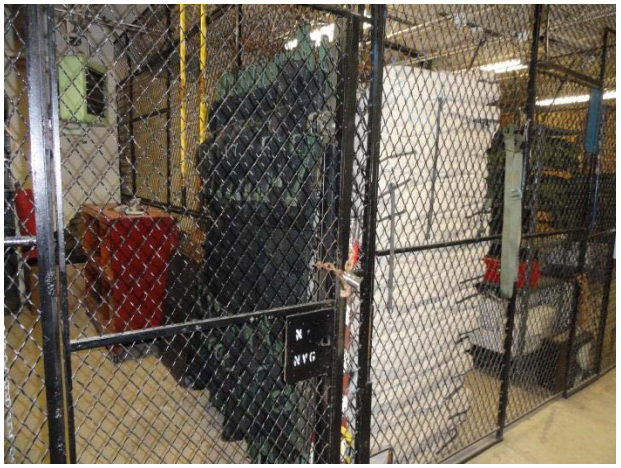
New London, CT Readiness Center



Storage Area



Storage Cage

Electrical Boxes at Entrance to Boiler Room

Water Intrusion on Floor

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New London, CT Readiness Center

Hard Elbow Pipe Insulation

Stained Ceiling Tile and Rusty Pipes

Training Room

Unit Heaters

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New London, CT Readiness Center

Custodial Closet

Heater

Office

Locker Room

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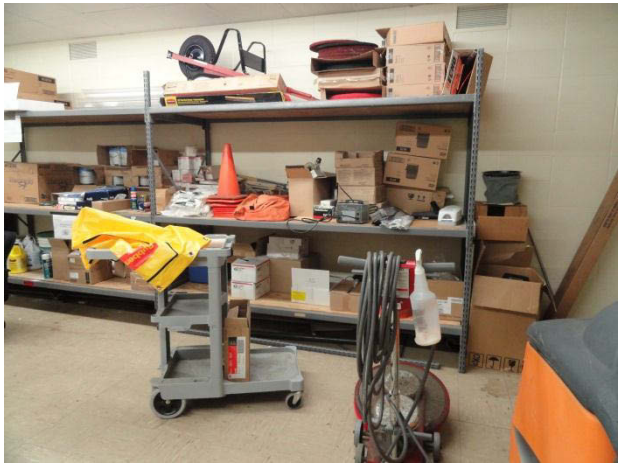
New London, CT Readiness Center

Stained Ceiling Tiles

Latrine



Maintainer's Storage Area

Maintainer's Storage Area

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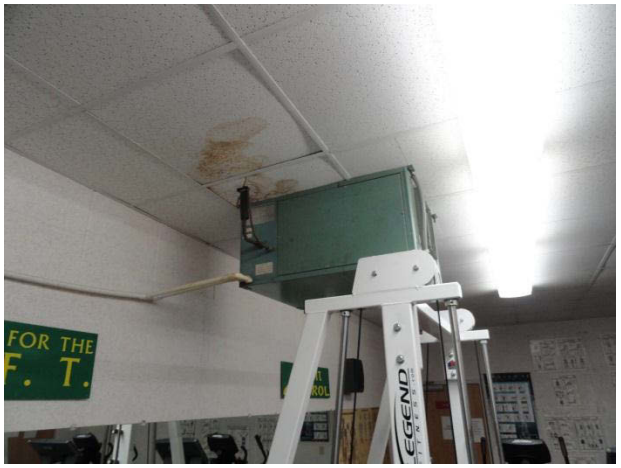
New London, CT Readiness Center

Fitness Center



Stained Ceiling Tiles near Heater

Stained Ceiling Tiles near Heater

Classroom

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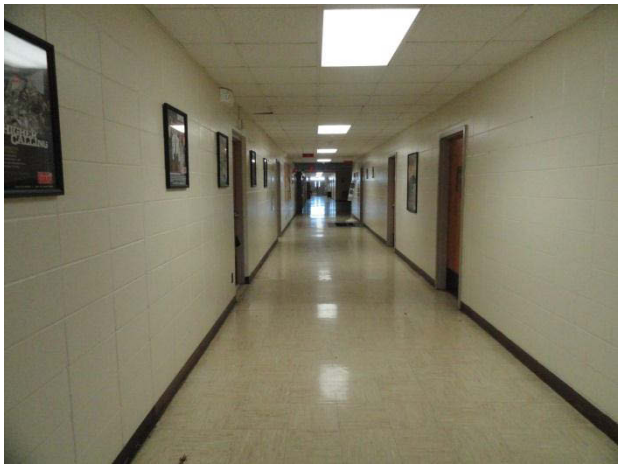
New London, CT Readiness Center

Office

Office



Hallway

Conference Room

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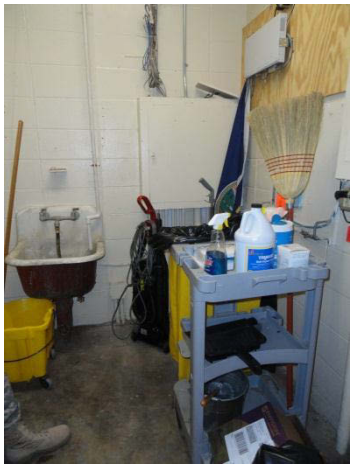
New London, CT Readiness Center

Office

Office



Custodial Closet

Damaged Pipe Wrap

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Appendix D
IAQ and Lighting Survey Log Sheets

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	New London	IAQ								Light		
Date	8/29/2012	Inspecto	Non Responsive [redacted]	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296						Serial Number		3021
Weather Conditions				Last Calibration		Mar-12						Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Drill Hall		2	8:55	77.1		50.8		505		1.0		29-38	X	50
Dining Room		2	9:01	76.7		44.2		301		0.5		30-140		30
Kitchen		2	9:03									77-140		50
Wash Room		2	9:05	77.4		44.8		303		0.8		9-185	X	30
Food Storage		2	9:06	81.9	X	43.0		319		0.4		40-148		30
Storage Garage		2	9:07	76.3		38.6		300		0.4		50-188		30
Supply Storage 32		2	9:17	76.9		56.9		351		0.1		15-45	X	30
Electrical Room		2	9:18	76.1		46.8		318		0.2		15-20	X	30
Storage in Electrical Room		1										50-60		30
Boiler Room		1	9:19	75.1		45.1		310		0.1		30-80		30
Office 27		2	9:26	75.8		54.3		311		0.3		13-35	X	30-50
Office 22		2	9:27	77.3		55.6		383		0.1		30-60		30-50
Office 25		2	9:27	77.2		52.1		336		0.1		19-33		30-50
Men's Shower		1	9:31									17-60		5
Office 26		2	9:31	76.6		54.9		305		0.3		6-103		30-50
Entrance to Office 25		2	9:35	76.4		50.0		320		0.4		40-60		30-50
Custodial Closet 30A		1	9:36									25	X	30
Locker Room 23		2	9:38	76.3		54.0		326		0.2		30-68		7
Maintenance Office		2	9:41	76.3		48.8		329		0.4		80-110		30-50
Locker Room behind Maint.		1	9:41									80-120		7
Bath/Shower Area		2	9:42									50-103		5

FOIA Requested Record #J-15-0085 (CT)
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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	New London	IAQ							Light		
Date	8/29/2012	Inspector	[redacted]	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296					Serial Number		3021
Weather Conditions				Last Calibration		Mar-12					Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Fitness Center		2	9:46	76.8		53.1		349		0.4		4-85	X	30
Kitchenette 14		2	9:47	76.9		44.6		337		0.2		80-112		50
Classroom 21		2	9:50	76.9		43.5		303		0.4		55-122		30-50
Recon Office 20		2	9:51	72.3		40.2		335		0.5		38-54		30-50
Office 15		2	9:52	73.2		54.8		350		0.1		17-58	X	30-50
Recruiting Office		3	9:56	72.7		51.3		519		0.4		34-100		30-50
Conference Room		2	9:59	72.2		44.0		326		0.3		53-117		30-50
Office 10		2	10:05	75.6		50.3		330		0.7		20-62	X	30-50
Office 7		6	10:06	73.7		43.3		635		0.9		50-104		30-50
Office 7A		2	10:08	70.1		38.6		341		1.0		9-80	X	30-50
Janitor's Closet 6		2	11:09	76.2		43.5		363		0.5		50-63		30
Outside			9:09	73.7		38.9		295		0.1				

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
NORWALK ARMORY
NORWALK, CONNECTICUT

July 2006
PN: 39741509

Non-Responsive

Office Manager

Non-Responsive

Project Manager

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Page 525 of 1092

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TABLE OF CONTENTS

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FOIA Requested Record #J-15-0085 (CT)
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Page 526 of 1092

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APPENDICES

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Page 527 of 1092

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer workstations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (Department of the Army Pamphlet 40-21, Chapter 4, Page 7, Section 4-3)	RAC 3
Lead		
Lead was detected in wipe samples collected from the facility in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025 (e)(1)(i))	RAC 3
Asbestos		
Damaged ACM floor tiles in the back hall and day room, and damaged ACM pipe insulation were present in the firing range.	Repair or remove exposed ends or damaged asbestos-containing pipe insulation. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(2))	RAC 3
A site-specific asbestos operations and maintenance plan was available. No warning labels were posted in janitorial or maintenance areas.	Maintain a site specific asbestos operations and maintenance plan to manage asbestos-containing materials by labeling of asbestos (OSHA 29 CFR 1910.1001 (j)(4)).	RAC 3
Hazard Communication		
A site specific hazard communication plan was not available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in many of the offices.	Increase illumination through use of task lighting. (ANSI / IESNA RP-1-04)	RAC 4

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Norwalk Armory located at 29 New Caanan Ave. in Norwalk, Connecticut 06851. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On September 2, 2005, Ms. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Norwalk, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lt. Non-Responsive of the Connecticut ARNG was Ms. Non-Responsive site contact for this survey.

This armory is a two story brick building, with an attached drill hall that is constructed primarily of brick and mortar. This facility is built on a concrete slab, with a flat asphalt roof. An armory layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A. The risk assessment codes associated with this project are contained in Table 1.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 529 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Some computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning workstations at the time of this survey.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the drill hall, orderly room, and outside. These readings were all made using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 48.3 – 50.8% throughout the various building areas with an average of 49.2%. The average reading was below the recommended maximum level of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from 466 to 680 parts per million (ppm), with an average of 551 ppm. The outside reading was 420 ppm.

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 530 of 1092

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people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 420 ppm on the day of the survey, the ASHRAE limit would be 1,120 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 2.0 ppm to 3.0 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative areas was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 531 of 1092

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Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting Footcandles	Recommended Lighting Footcandles
1st Floor Storage Room	Warehouse	54	25
Day Room	Visitor's Area	33	20
Storage @ Loading Dock	Warehouse	12	25
Office #208	Administrative Duties	39	50
Office #207	Administrative Duties	51	50
Office #206	Administrative Duties	52	50
Office #205	Administrative Duties	29	50
Office #204	Administrative Duties	55	50
Commander's Room	Administrative Duties	27	50
Advisor	Administrative Duties	35	50
Locker Room	Dressing Room	33	10

On the day of the survey illumination in several of the offices was inadequate.

2.2.5 Lead

Wipe testing for lead was conducted in the administrative area using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 2-2 below shows the results of the lead sampling.

Table 2-2
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Men's Locker Room-Lockers	RWS-1	0.108	15	200
Room #205-Air Conditioner	RWS-2	0.108	110	200
Aid Room-Floor	RWS-3	0.108	6.8	200
Gym-Night Box	RWS-4	0.108	220	200
Mechanic-File Cabinet	RWS-5	0.108	32	200

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 532 of 1092

Table 2-2 (Continued)
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Kitchen-Fridge	RWS-6	0.108	25	200
Blank	Blank RWS	N/A	<0.3µg	N/A

Sample numbers and locations can be found on the site map in appendix A.

2.2.6 Asbestos

No bulk samples were collected from suspect asbestos-containing materials (ACM) for a determination of asbestos content. Damaged floor tiles were observed in the Day Room and the back hall (by the firing range) during the site visit. According to the site contact Lt. [redacted], these materials are known to be ACM.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The observed ergonomic issues were minor with regard to the desks, chairs and monitors and should be corrected by fitting the workplace to the workers.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 533 of 1092

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LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in several offices. URS recommends increasing the area lighting or supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: One (1) of the six (6) surface wipe samples in the administrative area was found to contain lead dust levels above the recommended limit set by the National Guard Bureau. URS recommends cleaning the Gym Night Box where lead was detected at a level greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025). The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

ASBESTOS: Appropriately trained and licensed personnel and / or contractors should remove damaged asbestos-containing floor tile.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 534 of 1092

3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now primarily used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Indoor Firing Range-Food Storage	FR-01	0.108	240	200
Indoor Firing Range-Floor	FR-02	0.108	240	200
Indoor Firing Range-Shelving	FR-03	0.108	410	200
Indoor Firing Range-Floor	FR-04	0.108	1300	200
Indoor Firing Range-Floor	FR-05	0.108	200	200
Blank	BLANK FRDH	N/A	0.36 μg	N/A

Sample numbers and locations can be found on the site map in appendix A.

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 535 of 1092

Table 3-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL ($\mu g/m^3$)
Former Firing Range – Center	0922-02	270	<11	50
Blank	0922-03	N/A	<3µg	N/A

On the day of the survey, the airborne lead dust level in the former firing range was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

3.2.2 Asbestos

No bulk samples were collected from suspect asbestos-containing materials (ACM) for a determination of asbestos content. Damaged pipe insulation was observed in the former firing range during the site visit. According to Lt. [redacted] this material is known to be ACM.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Each surface tested for lead in the former firing range was found to contain lead above the recommended limit of 200 micrograms per square foot. The U.S. Occupational Safety and Health Administration (OSHA) regulations, 29 CFR 1910.1025 and 29 CFR 1926.62 are designed to protect workers potentially exposed to elevated airborne levels of lead from lead-based paint. The NGB has prepared a memorandum

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 536 of 1092

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titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Guidelines for the cleaning and rehabilitation of former indoor firing ranges is provided in Appendix H.

ASBESTOS: Appropriately trained and licensed personnel and / or contractors should repair damaged asbestos-containing pipe insulation.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 537 of 1092

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 7,500 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall-Table	DH-01	0.108	150	200
Drill Hall-Thermostat	DH-02	0.108	15	200
Drill Hall-Floor	DH-03	0.108	160	200
Drill Hall-Fire Pull Box	DH-04	0.108	170	200
Drill Hall-Center Floor	DH-05	0.108	9.8	200
Blank	BLANK FRDH	N/A	0.36 µg	N/A

Sample numbers and locations can be found on the site map in Appendix A.

A paint chip was collected in an area where paint was peeling and sent to AMA for analysis. The sample was found to contain lead in a concentration below the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. Levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 4-2 below shows the results of the lead paint testing.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 538 of 1092

Table 4-2
Level of Lead in Paint Found in the Drill Hall

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Drill Hall	PNT-01	0.01	<0.0075

Sample number and location can be found on the site map in appendix A.

The analytical report from AMA is contained in Appendix D.

One air sample for lead dust was also collected in the drill hall. Table 4-3 below shows the result of this air sample.

Table 4-3
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL ($\mu g/m^3$)
Drill Hall – Center	0922-01	270	<11	50
Blank	0922-03	N/A	<3μg	N/A

On the day of the survey, the airborne lead dust level in the drill hall was found to be acceptable, below OSHA's permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 539 of 1092

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4.6 Interpretation of Results

LEAD: All dust wipe samples collected from the drill hall were below 200 micrograms/ square foot. This is the level recommended by the Region North Industrial Hygiene office (Appendix G).

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FOIA Requested Record #J-15-0085 (CT)
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Page 540 of 1092

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5.0 BOILER ROOM

5.1 Operation Description

Not evaluated.

5.2 Chemical and Physical Agents Sampled

Not evaluated.

5.3 Ventilation System Evaluation

Not evaluated.

5.4 Noise Measurements

Not evaluated.

5.5 Personal Protective Equipment

Not evaluated.

5.6 Interpretation of Results

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 541 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

Though chemical inventory sheets and MSDS's were found on site, a site-specific program was not found regarding hazard communication. Training records were not found on site. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 542 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/IESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities for Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15, 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 543 of 1092

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APPENDIX A

ARMORY DRAWING

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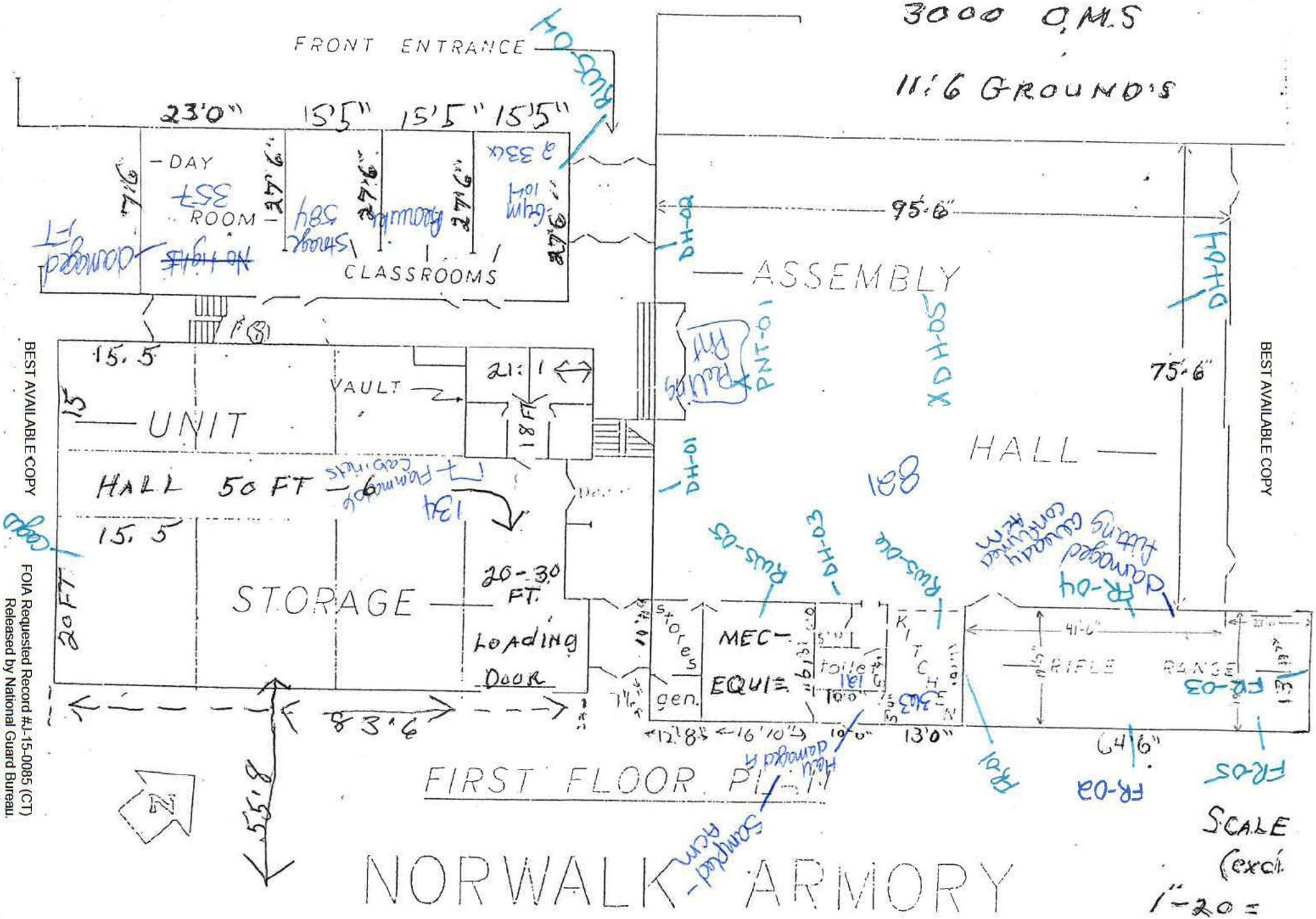
1.

27.720 ARMORY

3000 O.M.S

11:6 GROUND'S



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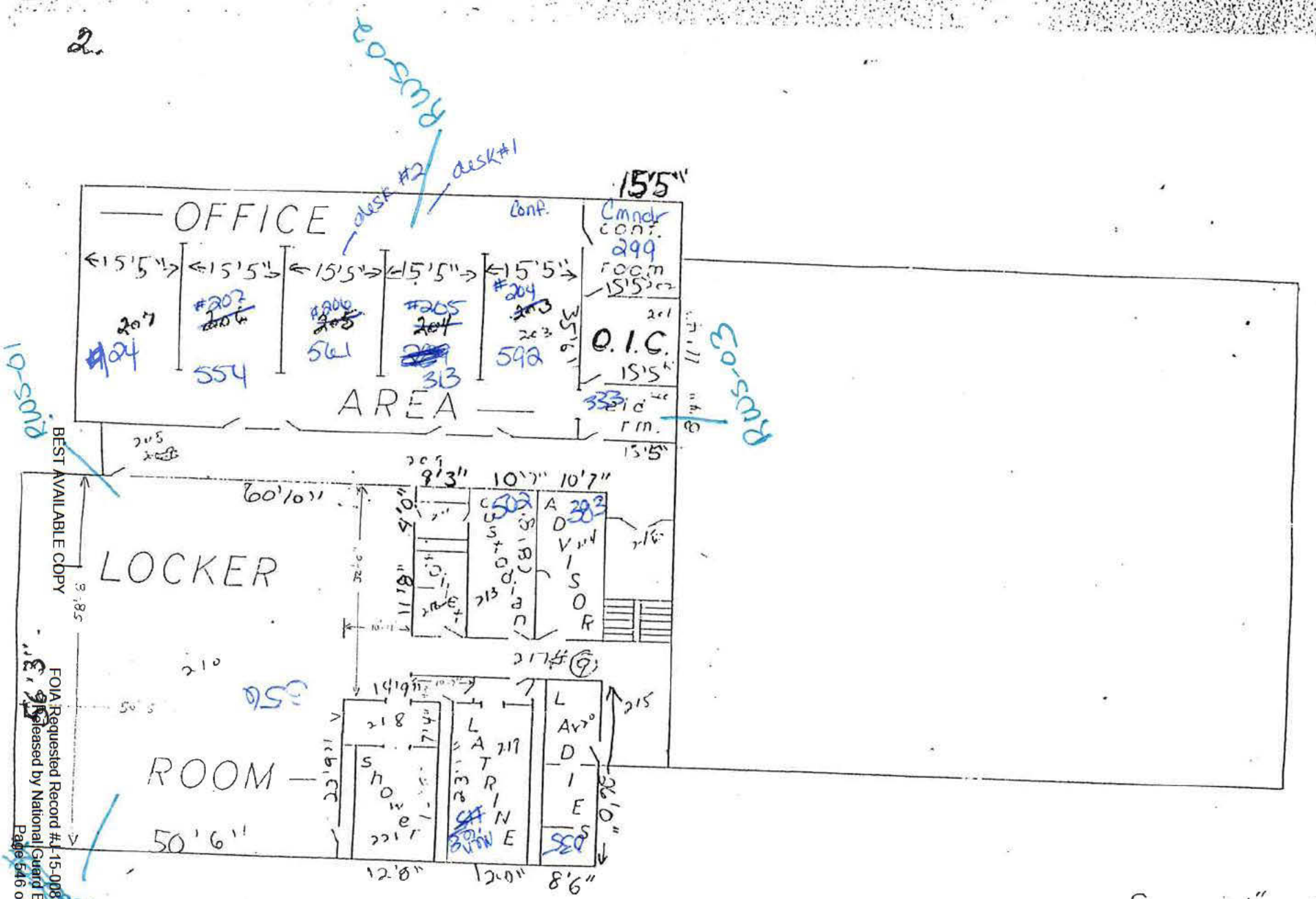
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau.
Page 545 of 1092

2.



SECOND FLOOR PLAN

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Page 546 of 1092

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APPENDIX B

PERSONNEL LIST

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 547 of 1092

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PERSONEL LIST
NORWALK ARMORY

Name	Rank
Non-Responsive	Not Provided
	Not Provided

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APPENDIX C

HAZARDOUS MATERIALS LIST

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APPENDIX D

ANALYTICAL RESULTS

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AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	URS Corporation	**Job Name:**	Army National Guard	**Chain Of Custody:**	147452		
Address:	5 Industrial Way	**Job Location:**	Norwalk Armory-Norwalk, CT	**Date Submitted:**	12/29/2005		
	Salem, New Hampshire 03079-2830	**Job Number:**	39741509 00401	**Person Submitting:**			
		P.O. Number:	Not Provided	**Date Analyzed:**	12/30/2005	**Report Date:**	04-Jan-06

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0617052	RWS-01	Furnace	Wipe	****	0.108	2.79	ug/ft²	15	ug/ft²	
0617053	RWS-02	Furnace	Wipe	****	0.108	69.70	ug/ft²	110	ug/ft²	
0617054	RWS-03	Furnace	Wipe	****	0.108	2.79	ug/ft²	6.8	ug/ft²	
0617055	RWS-04	Furnace	Wipe	****	0.108	69.70	ug/ft²	220	ug/ft²	
0617056	RWS-05	Furnace	Wipe	****	0.108	13.94	ug/ft²	32	ug/ft²	
0617057	RWS-06	Furnace	Wipe	****	0.108	2.79	ug/ft²	25	ug/ft²	
0617058	Blank RWS	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0617059	FR-01	Furnace	Wipe	****	0.108	69.70	ug/ft²	240	ug/ft²	
0617060	FR-02	Furnace	Wipe	****	0.108	69.70	ug/ft²	240	ug/ft²	
0617061	FR-03	Furnace	Wipe	****	0.108	69.70	ug/ft²	410	ug/ft²	
0617062	FR-04	Furnace	Wipe	****	0.108	139.41	ug/ft²	1300	ug/ft²	
0617063	FR-05	Furnace	Wipe	****	0.108	69.70	ug/ft²	200	ug/ft²	
0617064	DH-01	Furnace	Wipe	****	0.108	69.70	ug/ft²	150	ug/ft²	
0617065	DH-02	Furnace	Wipe	****	0.108	2.79	ug/ft²	15	ug/ft²	
0617066	DH-03	Furnace	Wipe	****	0.108	69.70	ug/ft²	160	ug/ft²	
0617067	DH-04	Furnace	Wipe	****	0.108	69.70	ug/ft²	170	ug/ft²	
0617068	DH-05	Furnace	Wipe	****	0.108	2.79	ug/ft²	9.8	ug/ft²	
0617069	BLANK FRDH	Furnace	Wipe Blank	****	N/A	0.30	ug	0.36	ug	
0617070	PNT-01	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.0075	%Pb	
0617071	092201	Flame	Air	270	N/A	11.11	ug/m³	< 11	ug/m³	

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 552 of 1092

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	URS Corporation	Job Name:	Army National Guard	Chain Of Custody:	147452		
Address:	5 Industrial Way	Job Location:	Norwalk Armory-Norwalk, CT	Date Submitted:	12/29/2005		
	Salem, New Hampshire 03079-2830	Job Number:	39741509 00401	Person Submitting:			
		P.O. Number:	Not Provided	Date Analyzed:	12/30/2005	Report Date:	04-Jan-06

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0617072	092202	Flame	Air	270	N/A	11.11	ug/m³	<	11	ug/m³	
0617073	092203	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Technical Manager: [redacted]

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 553 of 1092

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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APPENDIX E

TRAINING CERTIFICATES

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Page 554 of 1092

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Certificate of Training

Non-Responsive

For successful completion of a 4 Hour, 1/2 Day

Asbestos Building Inspector

Annual Refresher Training

JULY 17, 2003

This training was approved and given in accordance with the Regulations for Connecticut State Agencies RCSA 20 - 440 - 1-9 and RCSA 20-441 and meets the requirements of the EPA Revised MAP under TSCA Title II of 4/4/94.

Presented by

Mystic Air Quality Consultants, Inc.
1204 North Road, Groton, CT 06340 (800) 247-7746

Certificate Number: ABIRF10892

Exam Grade: 97%

Exam Date: 07/17/2003

07/17/2004

Non-Responsive

ing Director

Non-Responsive

CSP, RS

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APPENDIX F

PHOTOGRAPHS

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 556 of 1092

Photo 1:
Chemical Storage

Photo 2:
Workstation with unadjustable chair

Photo 3:
Flammable Cabinets @ Vault

Photo 4:
Day Room-Damaged ACM Floor Tile

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Photo 5:
Drill Hall-Peeling Paint

Photo 7:
Former Firing Range-Layout

Photo 6:
Former Firing Range-Damaged ACM
Pipe Fitting

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 558 of 1092

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15, 30 DECEMBER 2002)

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 563 of 1092

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter diameter Whatman ™ #40 paper

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 564 of 1092

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(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 565 of 1092

BEST AVAILABLE COPY

b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 566 of 1092

BEST AVAILABLE COPY

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment

For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping

This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance

The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 567 of 1092

BEST AVAILABLE COPY

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead contalning debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 568 of 1092

BEST AVAILABLE COPY

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 569 of 1092

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APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 570 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 571 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 572 of 1092

BEST AVAILABLE COPY

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address		Point of Contact *(name & phone #)* Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			

Sampling Data

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 573 of 1092

BEST AVAILABLE COPY

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 574 of 1092

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APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 575 of 1092

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APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 576 of 1092

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 577 of 1092

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, Connecticut 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
NORWICH ARMORY
NORWICH, CONNECTICUT

July 2006
PN: 39741509

Non-Responsive

Office Manager

Non-Responsive

Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 578 of 1092

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TABLE OF CONTENTS

Section **Page**

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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TABLE OF CONTENTS (Cont)

APPENDICES

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 580 of 1092

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate.	Increase illumination through use of task lighting. (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in wipe samples collected from the firing range and the boiler room in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range and boiler room where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Mold		
Water damaged was observed in the administrative area. Mold growth could become an issue if left unattended.	Determine and repair source of water. Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4
Hazard Communication		
A site specific hazard communication plan was not available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Asbestos		
Exposed asbestos-containing floor tile mastic was previously identified throughout the facility.	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j)	RAC 3

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 581 of 1092

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Norwich Armory located at 38 Stott Avenue in Norwich, Connecticut 06360. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On September 8, 2005, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Norwich, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Mr Non-Responsive site contact for this survey.

This armory is a two-story brick and block building, with an attached drill hall that is constructed primarily of brick and mortar. This facility is built on a concrete slab, with a flat asphalt roof. The building was constructed in 1978. A layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 582 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. This is particularly true for part time employees. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were given concerning workstations at the time of this survey.

Minor water stains were observed throughout the administrative area.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the MP orderly room, Engineering orderly room, outside. These readings were all measured using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 56.3-56.7 % throughout the administration areas with an average of 56.5%. The average reading was below recommended maximum of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from a low of 413 to a spike of 500 parts per million (ppm), with an average of 456.5 ppm. The outside reading was 400 ppm.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 583 of 1092

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Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 400 ppm on the day of the survey, the ASHRAE limit would be 1,100 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 0 to 2 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 584 of 1092

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (lux/ foot candles)	Recommended Lighting (lux / foot candles)
MP Orderly Room- Desk Near Windows	Office	448 / 42	500 / 50
MP Orderly Room- Desk Near Door	Office	318 / 29	500 / 50
MP Orderly Room- Conference Table	Office	453 / 43	500 / 50
Recruiter's Desk	Office	708 / 66	500 / 50
Supply Office- 248th Engineering	Office	778 / 78	500 / 50
Administration Office- 248th Engineering	Office	599 / 56	500 / 50
Weight Control Office	Office	790 / 73	500 / 50
Conference Room- Table	Office	1023 / 96	500 / 50
Classroom Next to Kitchen	Classroom	540 / 48	500 / 50
Classroom Further from Kitchen	Classroom	696 / 65	500 / 50

2.2.5 Lead

Wipe testing for lead dust was conducted in the administrative area using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 2-2 below shows the results of the lead sampling.

Table 2-2
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Food Prep Room – Floor	0908-16	0.111	5.9	200
248 Eng. Storage – Locker Top	0908-17	0.111	25	200
Large Locker Room – Locker Top	0908-18	0.111	11	200

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 585 of 1092

Table 2-2 (Continued)
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Maintenance – Top of Washing Machine	0908-19	0.111	58	200
Solar Room – Top of Electrical Box	0908-20	0.111	140	200
192 FA Admin Office – Window Sill	0908-22	0.111	84	200
Recruiter Office – Window Sill	0908-23	0.111	110	200
1st SGT Office – Floor	0908-24	0.111	2.2	200
Conference Room – Window Sill	0908-25	0.111	13	200
Blank	0908-15	N/A	<0.3 µg	N/A

2.2.6 Asbestos

Bulk samples of suspect asbestos containing materials (ACM) in the form of floor tile were previously collected by Environmental Services determination of asbestos content. The floor tile mastic was found to contain 17% Chrysotile.

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)).

2.3 Ventilation System Evaluation

No local exhaust ventilation (LEV) and general exhaust ventilation (GEV) in this area.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 586 of 1092

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2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in approximately 50% of the offices and generally throughout the facility. URS recommends increasing the area lighting or supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

MOLD: Minor water stains were observed throughout the administrative area. Mold could become a factor if left unattended

LEAD: Wipe samples collected from the administrative area for lead were found to be within the allowable limits set by the NGB Region North Industrial Hygiene Office. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 587 of 1092

3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now used for an NCO and storage room.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead dust was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Indoor Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Firing End – Top of Flammable Storage Cabinet	0908-09	0.111	150	200
Firing End - Floor	0908-10	0.111	680	200
Mid Floor – Floor	0908-11	0.111	280	200
Center - Floor	0908-12	0.111	140	200
20' From Bullet Trap – Floor	0908-13	0.111	280	200
Blank	0908-14	N/A	<0.3 µg	N/A

An air sample for lead dust was collected from Former Indoor Firing Range. Table 3-2 below shows the result of these air samples.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 588 of 1092

Table 3-2
Airborne Concentrations of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Permissible Exposure Limit ($\mu g/m^3$)
Former Firing Range Center	0908-01	263	<11	50.0
Blank	0908-03	N/A	<3	N/A

On the day of the survey, the airborne lead dust levels in the drill hall and mess hall were found to be below the OSHA permissible exposure limit of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

3.3 Ventilation System Evaluation

No local exhaust ventilation (LEV) and general exhaust ventilation (GEV) in this area.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Wipe samples collected from the former indoor firing range for lead were found to be above the allowable limits set by the NGB Region North Industrial Hygiene Office. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Guidelines for the cleanup and rehabilitation of former indoor firing ranges is provided in Appendix H.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 589 of 1092

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a concrete floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Southeast - Top of Vending Machine	0908-04	0.111	130	200
Northeast Corner – Floor	0908-05	0.111	100	200
Center – Floor	0908-06	0.111	25	200
Southwest – Floor	0908-07	0.111	27	200
Northwest – Floor	0908-08	0.111	34	
Blank	0908-14	N/A	<0.3 µg	N/A

Sample numbers and locations can be found on the site map in Appendix A.

An air sample for lead dust was collected from the Drill Hall. Table 4-2 below shows the result of these air samples.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 590 of 1092

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Table 4-2
Airborne Concentrations of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Permissible Exposure Limit ($\mu g/m^3$)
Drill Hall	0908-02	175	<17	50.0
Blank	0908-03	N/A	<3	N/A

On the day of the survey, the airborne lead dust levels in the drill hall and mess hall were found to be below the OSHA permissible exposure limit of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

No local exhaust ventilation (LEV) and general exhaust ventilation (GEV) in this area.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be within the allowable limits set by the NGB Region North Industrial Hygiene Office. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 591 of 1092

5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical room made of cinder block walls with a concrete floor containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

5.2.1 Lead

Wipe testing for lead dust was conducted in the boiler room using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 5-1 below shows the results of the lead sampling.

Table 5-1
Levels of Lead Dust Found in the Boiler Room

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Top of Electrical Box	0908-21	0.111	1000	200
Blank	0908-15	N/A	<0.3 µg	N/A

5.3 Ventilation System Evaluation

No local exhaust ventilation (LEV) and general exhaust ventilation (GEV) in this area.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

LEAD: A wipe sample collected from the boiler room for lead was found to be above the allowable limits set by the NGB Region North Industrial Hygiene Office. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. URS recommends that personnel trained in accordance with OSHA's lead standard (29 CFR1910.1025 and 29 CFR1910.62) clean this area.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 592 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was found regarding hazardous communications. Training records maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 593 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 594 of 1092

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APPENDIX A

ARMORY DRAWING

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FOIA Requested Record #J-15-0085 (CT)
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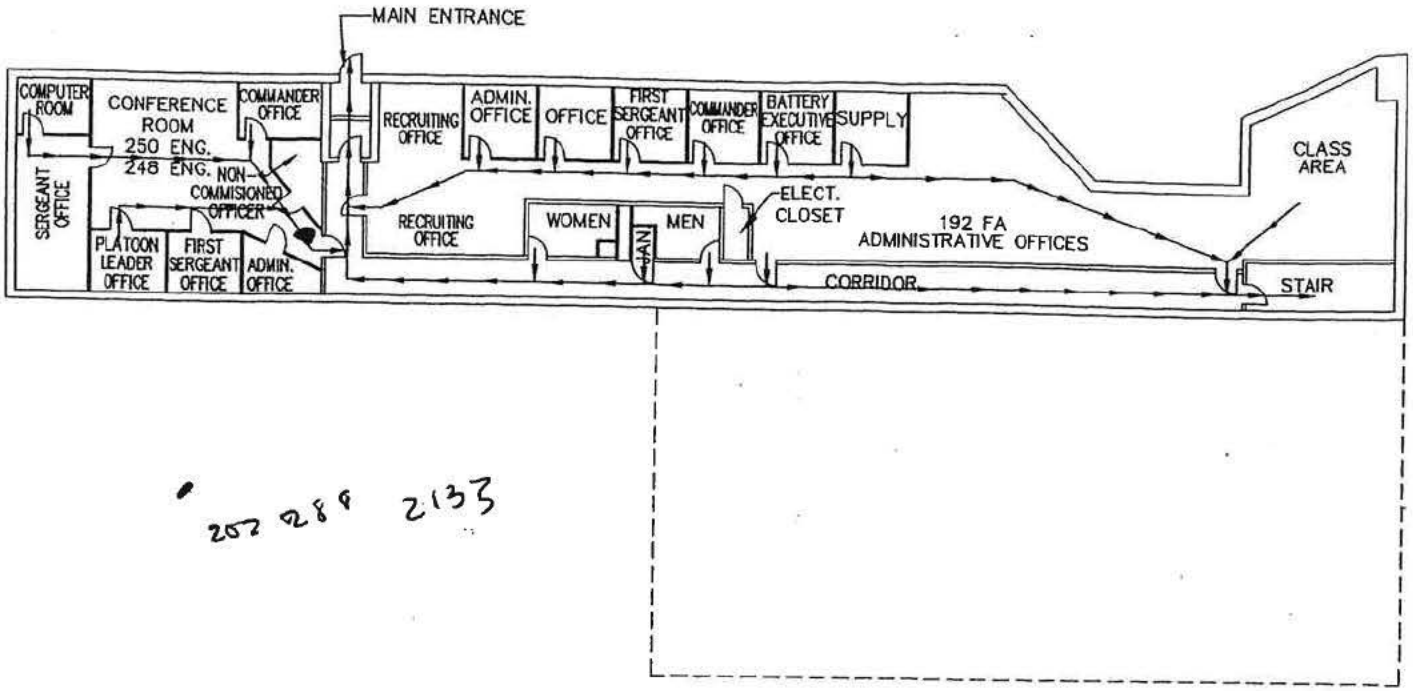

202 288 2133

LEGEND
- SWING DOOR
- OVER HEAD DOOR
- STAIRWAY
- DOUBLE DOOR
- SINK
- WALL
- MESH WALL
- PRIMARY ROUTE

Built 1978

DTC NO.: 96-296-100

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EMERGENCY EVACUATION ROUTES
RESERVE CENTER ARMORY – SECOND FLOOR
CONNECTICUT ARMY NATIONAL GAURD
38 STOTT AVENUE
NORWICH, CONNECTICUT

SCALE: N.T.S. JULY, 1997

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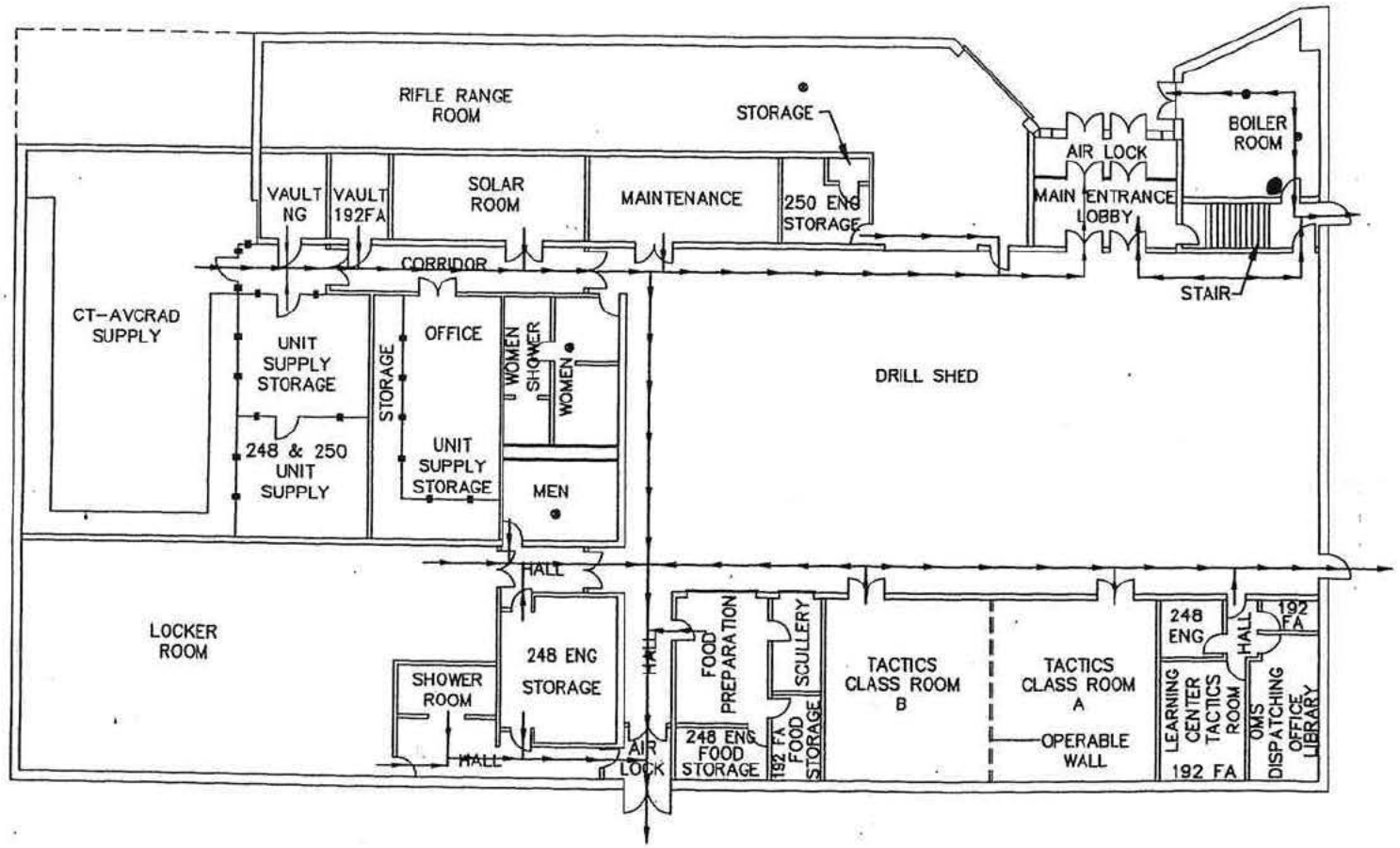
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 596 of 1092



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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 597 of 1092

BEST AVAILABLE COPY

APPENDIX B

PERSONNEL LIST

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 598 of 1092

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No Staff On Site

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APPENDIX C

HAZARDOUS MATERIALS LIST

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FLAMMABLE CABINET

ITEM	NSN	CONTAINER	QTY O/H
TOP SHELF			
INSECT REPELLENT	6840012781336	6 OZ CAN	10
TRANSMISSION FLUID	9150013534799	1 QT BOTTLE	1
TRANSMISSION FLUID	9150006982382	1 QT CAN	2
CLP	9150010798124	4 OZ BOTTLE	15
CLP	9150010546453	1 PT BOTTLE	1
CLP	9150010536688	1 GAL CAN	2
N-AMYL ACETATE	6810001237047	1 PT BOTTLE	1
MIDDLE SHELF			
SPRAY PAINT		12 OZ CAN	13
MOTOR OIL		1 QT BOTTLE	4
2 CYCLE OIL	9150001178791	1 PT BOTTLE	6
CLP		1/2 OZ BOTTLE	16
BOTTOM SHELF			
DIESEL FUEL		5 GAL CAN	2
CLP	9150010536688	1 GAL CAN	2
PAINT THINNER		1 GAL CAN	1
COELMAN FUEL		1 GAL CAN	1
GAS / OIL MIX		1 GAL CAN	1
BAR / CHAIN OIL		1 GAL CAN	1
SILICONE BRAKE FLUID	9150011029455	1 GAL CAN	1

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APPENDIX D

ANALYTICAL RESULTS

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10/04/2005 08:03 2023 NO.774 P06 AEROSOL MONITORING & ANALYSIS → 16038936240

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Norwick Armory	**Chain Of Custody:**	144190		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Armory/Admin/Assembly	**Date Submitted:**	9/27/2005		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**			
		P.O. Number:	Not Provided	**Date Analyzed:**	9/30/2005	**Report Date:**	03-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0568538	0908 04	Furnace	Wipe	****	0.111	67.51	ug/ft²	130	ug/ft²	
0568539	0908 05	Furnace	Wipe	****	0.111	67.51	ug/ft²	100	ug/ft²	
0568540	0908 06	Furnace	Wipe	****	0.111	13.50	ug/ft²	25	ug/ft²	
0568541	0908 07	Furnace	Wipe	****	0.111	13.50	ug/ft²	27	ug/ft²	
0568542	0908 08	Furnace	Wipe	****	0.111	13.50	ug/ft²	34	ug/ft²	
0568543	0908 09	Furnace	Wipe	****	0.111	67.51	ug/ft²	150	ug/ft²	
0568544	0908 10	Furnace	Wipe	****	0.111	67.51	ug/ft²	680	ug/ft²	
0568545	0908 11	Furnace	Wipe	****	0.111	67.51	ug/ft²	280	ug/ft²	
0568546	0908 12	Furnace	Wipe	****	0.111	67.51	ug/ft²	140	ug/ft²	
0568547	0908 13	Furnace	Wipe	****	0.111	67.51	ug/ft²	280	ug/ft²	
0568548	0908 14	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non Responsive **nical Manager:** [redacted]

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10/28/2005 13:04 4103 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.203 002

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A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Norwick Armory	**Chain Of Custody:**	145340
Address:	301-H Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Armory/Admin/Assemblies	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	10/28/2005 **Report Date:** 28-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0604335	0908-15	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0604336	0908-16	Furnace	Wipe	****	0.108	2.79	ug/ft²	5.9	ug/ft²	
0604337	0908-17	Furnace	Wipe	****	0.108	2.79	ug/ft²	25	ug/ft²	
0604338	0908-18	Furnace	Wipe	****	0.108	2.79	ug/ft²	11	ug/ft²	
0604339	0908-19	Furnace	Wipe	****	0.108	13.94	ug/ft²	58	ug/ft²	
0604340	0908-20	Furnace	Wipe	****	0.108	69.70	ug/ft²	140	ug/ft²	
0604341	0908-21	Furnace	Wipe	****	0.108	139.41	ug/ft²	1000	ug/ft²	
0604342	0908-22	Furnace	Wipe	****	0.108	69.70	ug/ft²	84	ug/ft²	
0604343	0908-23	Furnace	Wipe	****	0.108	69.70	ug/ft²	110	ug/ft²	
0604344	0908-24	Furnace	Wipe	****	0.108	2.79	ug/ft²	5.2	ug/ft²	
0604345	0908-25	Furnace	Wipe	****	0.108	2.79	ug/ft²	13	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] **Technical Manager:** [redacted]

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09/28/2005 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.633 003

AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	144193
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	38 Stott Ave. Norwich CT	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	3974150900401	**Date Analyzed:**	9/28/2005 **Report Date:** 28-Sep-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0568350	090801	Flame	Air	263	N/A	11.41	ug/m³	<	11	ug/m³	
0568351	090802	Flame	Air	175	N/A	17.14	ug/m³	<	17	ug/m³	
0568352	090803	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted]

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APPENDIX E

TRAINING CERTIFICATES

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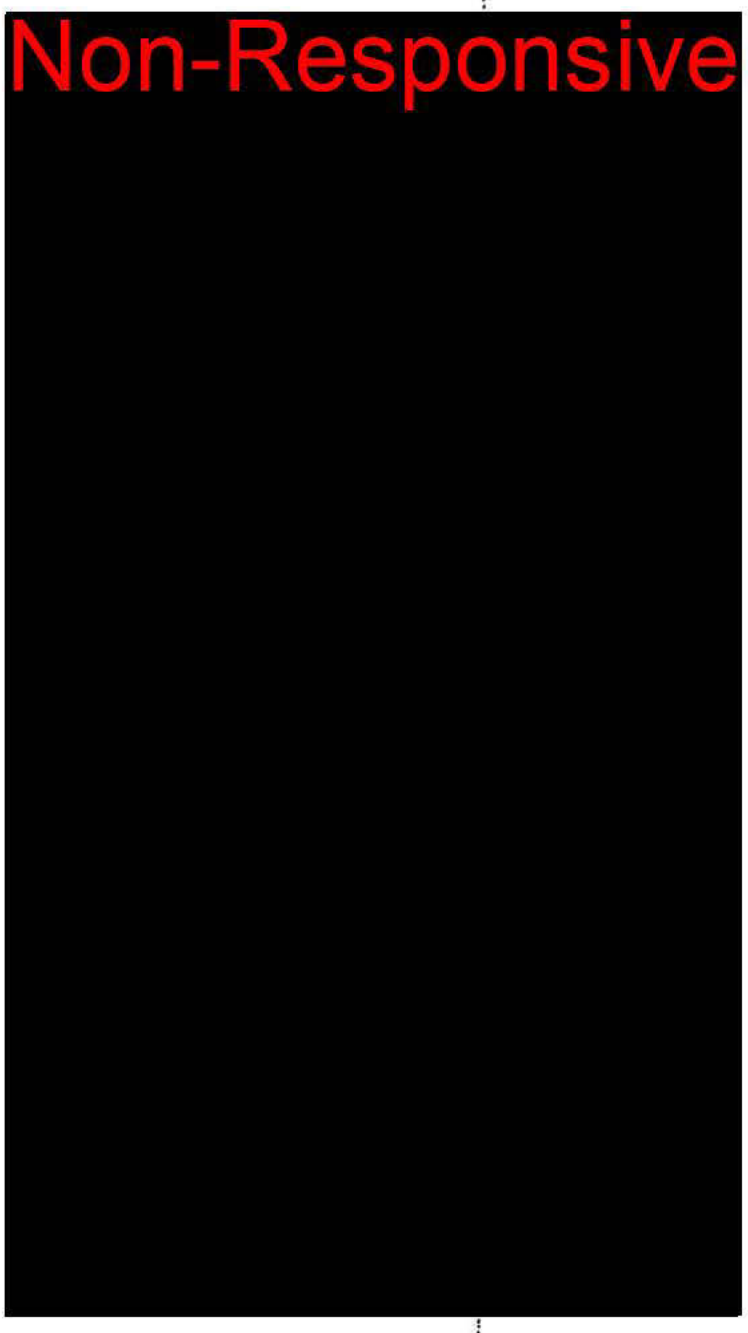

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Page 607 of 1092

May-04-05 09:34am From-URS CORPORATION T-867 P.03/05 F-090

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation

Asbestos Project Monitor Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

For course participants seeking New York State certification or New York State training reciprocity, the official record of successful completion is the DOH 2832 Certificate of Completion of Asbestos Safety Training

February 16, 2005
Course Dates

February 16, 2006
Expiration Date

February 16, 2005
Examination Date

[redacted]
President/Director of Training

05739517413670
Certificate Number

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APPENDIX F

PHOTOGRAPHS

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Photo 7030: 192 FA Admin Office – Wipe 0908-22

Photo 7031: Recruiter Office - Wipe 0908-23

Photo 7032: 1st SGT Office – Wipe 0908-24

Photo 7033: Conference Room – Wipe 0908-25

Photo 7034: Stairwell – Water damaged ceiling tile

Photo 7035: Drill Hall

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Photo 7036: Drill Hall

Photo 7037: Drill Hall

Photo 7038: Drill Hall

Photo 7039: Boiler Room - Wipe 0908-21

Photo 7040: Former Indoor Firing Range

Photo 7041: Former Indoor Firing Range

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Photo 7042: Former Indoor Firing Range

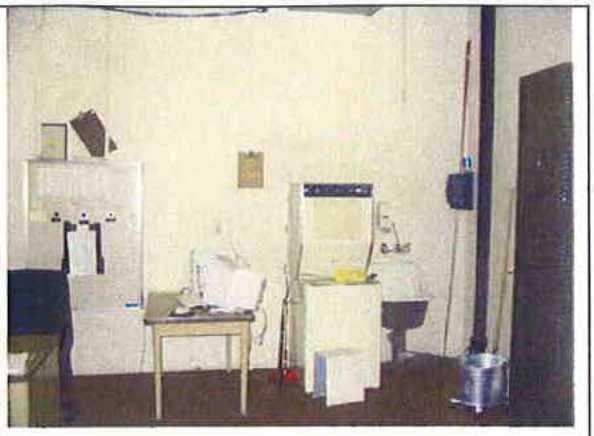

Photo 7043: Maintenance – Wipe 0908-19

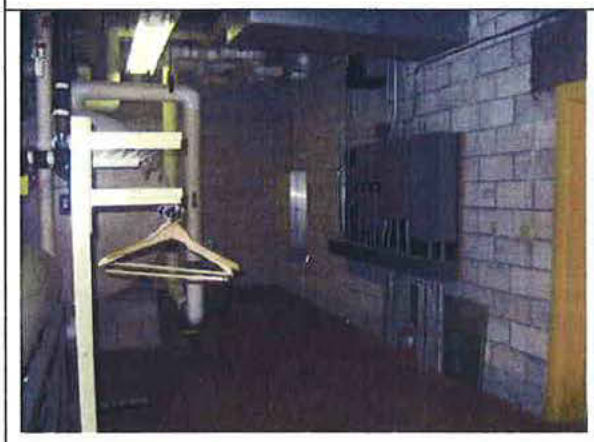

Photo 7044: Solar Room - Wipe 0908-20

Photo 7045: Supply Room -

Photo 7046: Food Prep - Wipe 0908-16

Photo 7047: Engineering Storage - Wipe 0908-17

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Photo 7048: Locker Room - Wipe 0908-18	Photo 7049: Drill Hall – Water marks on wall

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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FOIA Requested Record #J-15-0085 (CT)
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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15 30 DECEMBER 2002)

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FOIA Requested Record #J-15-0085 (CT)
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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

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Page 618 of 1092

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3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, In so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman ™ #40 paper.

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Page 619 of 1092

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(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

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Page 620 of 1092

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b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 621 of 1092

BEST AVAILABLE COPY

g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment

For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping

This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance

The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 622 of 1092

BEST AVAILABLE COPY

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 623 of 1092

BEST AVAILABLE COPY

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 624 of 1092

BEST AVAILABLE COPY

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 625 of 1092

BEST AVAILABLE COPY

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 626 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 627 of 1092

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address			Point of Contact *(name & phone #)* Samples Collected By
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			

Sampling Data

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 628 of 1092

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection

Analysis Desired

Sampling Data

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer

Comments to Lab:

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 629 of 1092

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APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 630 of 1092

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APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 631 of 1092

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Industrial Hygiene Survey

Connecticut Army National Guard (CT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Norwich Readiness Center
38 Stott Avenue
Norwich, CT 06360

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: August 22, 2012

AEI Project #: J12-676 3h CT Norwich RC

_____

Non-Responsive, **CIH, CSP, LEED Green Associate**
Industrial Hygienist

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 633 of 1092

Table of Contents

List of Tables and Appendices

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 634 of 1092

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) Norwich Readiness Center located at 38 Stott Avenue, Norwich, CT 06360 Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 22, 2012. The points of contact for the facility were SSG Non-Responsive and the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for samples collected from four areas of the former firing range. This firing range still has a bullet trap and has not been fully converted.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. End cap pipe insulation in the small boiler room and mastic patties behind sound proofing boards in the former firing range were damaged and bulk samples were collected and submitted for analysis. No asbestos was detected in the end cap pipe insulation sample and a trace amount of Chrysotile asbestos was detected in the mastic patty sample.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 10 foot candles (fc) to 145 fc.

Indoor Air Quality: Temperature measurements were slightly lower than the comfort ranges for the summer season, and relative humidity measurements were slightly above the comfort ranges on the day of the survey. The outdoor temperature and relative humidity were 80.2° F and 56.1% on the day of monitoring, and indoor conditions were similar to outdoor conditions. The facility has central air-conditioning in some areas, but the majority of the building is not air-conditioned. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide were below the recommended concentrations in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program dated 1992 was found in an old MSDS notebook. MSDSs were readily

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 635 of 1092

available; however, some updating is needed as required by the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200. It is recommended that the written hazard communication program be updated and placed in every MSDS notebook along with any related training records.

Overall, the Norwich Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 636 of 1092

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CT ARNG) Norwich Readiness Center located at 38 Stott Avenue, Norwich, CT 06360. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 22, 2012. The points of contact for the facility were SSG Non-Responsive and the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Norwich Readiness Center was built in the 1970's. The readiness center is staffed by 10 National Guard administrative personnel and 1 civilian caretaker (maintainer). The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Norwich Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Norwich facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state employed maintainer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 637 of 1092

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for damaged building materials that may contain asbestos or lead-based paint, for water damage or mold problems; for potential ergonomic problems; and for housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the state of Connecticut limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical Services, Inc. (AMA) of Lanham, MD for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Wipe samples collected from the facility were above the recommended maximum level for surface contamination in four of the sixteen wipe samples: from a flammable storage cabinet and three other areas in the former firing range. This firing range still has a bullet trap and has not been fully converted. Surfaces contaminated with lead dust should be cleaned using wet methods or high efficiency particulate air (HEPA)-filtered vacuums, and firing ranges should be converted in accordance with NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for CTARNG Norwich Readiness Center on August 22, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
Nor-W01	Drill Hall – center of floor	<110
Nor-W02	Drill Hall – floor near water fountains	<110
Nor-W03	Drill Hall – serving counter to kitchen	<110
Nor-W04	Drill Hall – dining table	<110
Nor-W05	Drill Hall – floor near overhead door	<110
Nor-W06	Kitchen – prep table	<110
Nor-W07	Kitchen – floor below prep table	<110

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 638 of 1092

Table 1 – Results of Dust Wipe Sampling for CTARNG Norwich Readiness Center on August 22, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
Nor-W08	Entrance to Drill Hall – floor	<110
Nor-W09	Former firing range – bullet trap	**420**
Nor-W10	Former firing range – floor at base of bullet trap	**550**
Nor-W11	Former firing range – floor in storage cage	**930**
Nor-W12	Former firing range – front cage floor	<110
Nor-W13	Former firing range – top of flammable cabinet	**3,600**
Nor-W14	Classroom – table top	<110
Nor-W15	SSG's Office – painted window sill	<110
Nor-W16	Ret. Office – window sill	110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft^2) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged end cap pipe insulation in the small boiler room and mastic patties from behind sound proofing boards in the former firing range were observed to be damaged. Samples were submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. No asbestos was detected in the end cap pipe insulation sample and a trace amount of Chrysotile asbestos was detected in the mastic patty sample.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable with room for improvement in some areas.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 639 of 1092

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 10 foot candles (fc) to over 145 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 66.6 to 75.1° F and 55.5 to 63.9% Rh. Temperatures were slightly lower and relative humidity measurements were slightly higher than the comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 80.2° F and 56.1%, and conditions inside were similar to the outdoor conditions. This readiness center has central air-conditioning in some areas but the majority of the building is not air-conditioned.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 387 to 548 parts per million (ppm). The outdoor CO_2 concentration was 466 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking

FOIA Requested Record #J-15-0085 (CT)
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Page 640 of 1092

lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.1 to 0.6 ppm; therefore all measurements were below the concentrations of concern.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program dated 1992 was found in an old MSDS notebook. MSDSs were readily available; however, some updating is needed as required by the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200. It is recommended that the written hazard communication program be updated and placed in every MSDS notebook along with any related training records.

7 Conclusions

The results of the evaluation indicated a few minor concerns at the facility. Overall, the Norwich Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 641 of 1092

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4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

FOIA Requested Record #J-15-0085 (CT)
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Page 642 of 1092

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Appendix A
Building Layout

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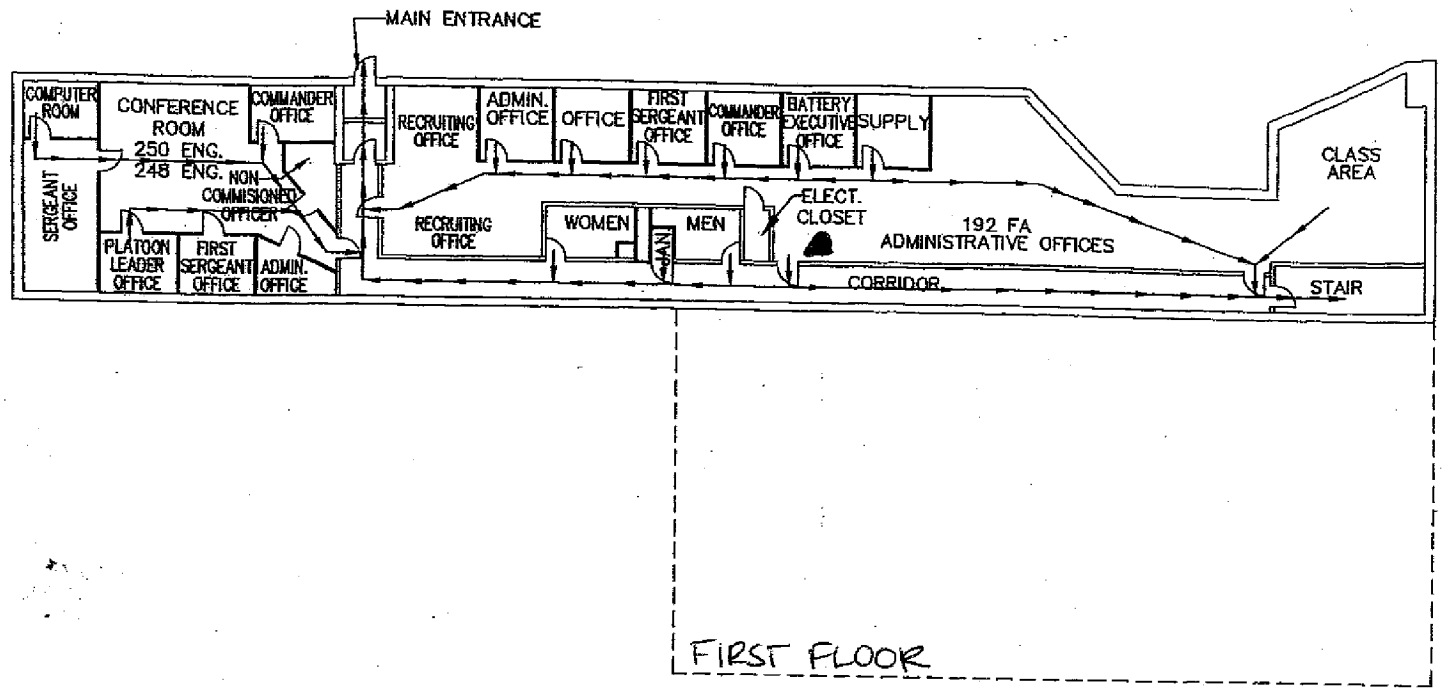

LEGEND
- SWING DOOR
- OVER HEAD DOOR
- STAIRWAY
- DOUBLE DOOR
- SINK
- WALL
- MESH WALL
- PRIMARY ROUTE

DTC NO.: 96-296-100

DIVERSIFIED TECHNOLOGIES CORPORATION
Engineers • Planners
Landscape Architects • Surveyors
844 Washington Avenue
North Haven, CT. 06473
Tel: (203) 239-4200

EMERGENCY EVACUATION ROUTES
RESERVE CENTER ARMORY – SECOND FLOOR
CONNECTICUT ARMY NATIONAL GAURD
38 STOTT AVENUE
NORWICH, CONNECTICUT

SCALE: N.T.S. JULY, 1997

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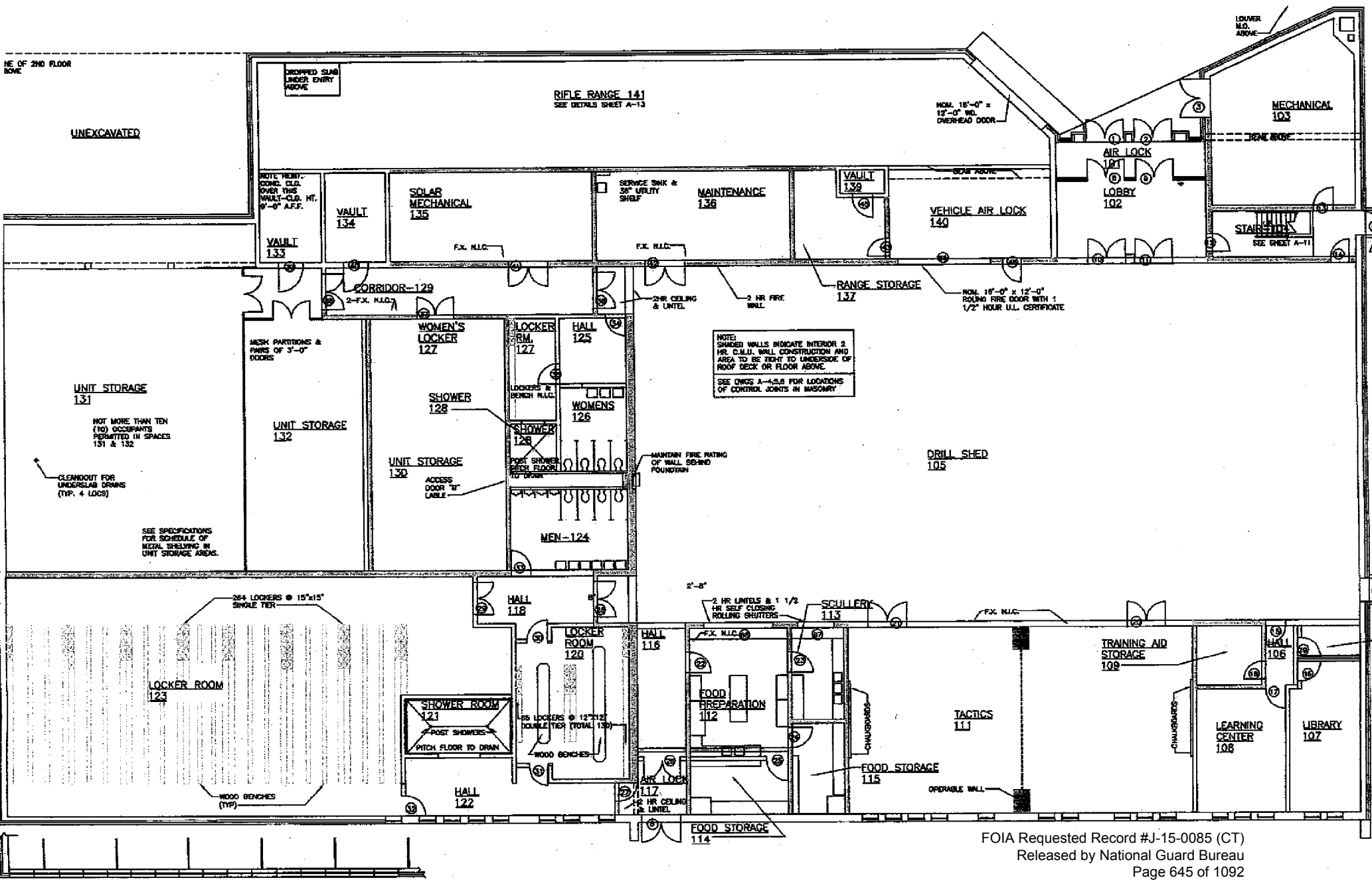

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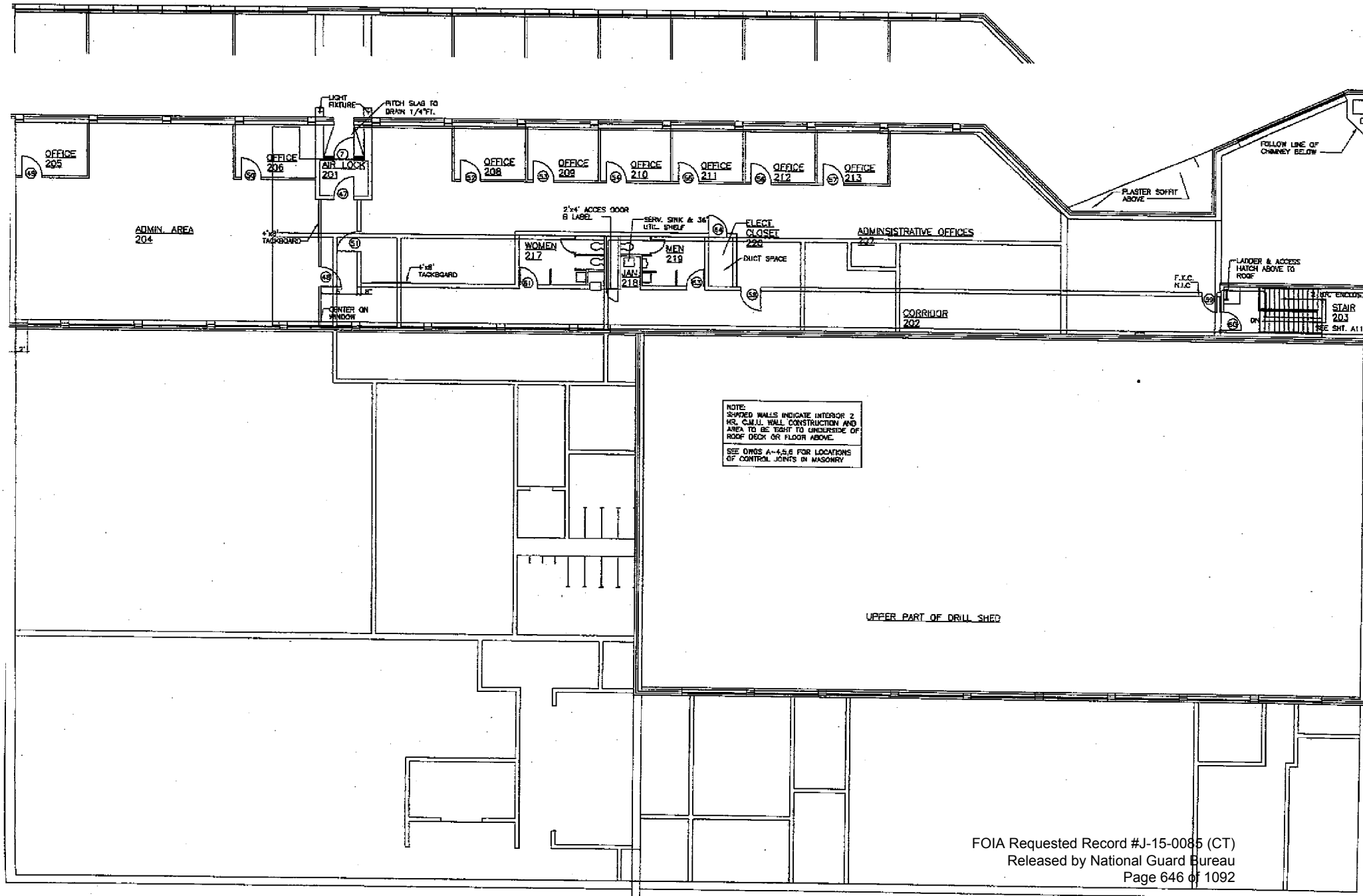
Downstairs
Norwich Armory



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Appendix B
Certificates of Analysis

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Norwich RC	**Chain Of Custody:**	513831
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Norwich, CT	**Date Analyzed:**	9/6/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12090019	Nor-Bulk 02	NAD	--	--	--	--	--	--	2	--	--	98	SSL	Gray	Homogeneous	SW	
12090020	Nor-Bulk 01	TR	TR	--	--	--	--	--	--	--	--	100	MS	Brown	Homogeneous	SW	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Director Non-Responsive **Analyst(s)** Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

NVLAP (101143-0) Accredited Laboratory
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INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Norwich RC	**Chain Of Custody:**	513831
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Norwich, CT	**Date Submitted:**	8/30/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/6/2012
				Report Date:	9/6/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
12090003	Nor-W 01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090004	Nor-W 02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090005	Nor-W 03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090006	Nor-W 04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090007	Nor-W 05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090008	Nor-W 06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090009	Nor-W 07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090010	Nor-W 08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090011	Nor-W 09	Flame	Wipe	****	0.108	110	ug/ft²	45	420	ug/ft²	
12090012	Nor-W 10	Flame	Wipe	****	0.108	110	ug/ft²	59	550	ug/ft²	
12090013	Nor-W 11	Flame	Wipe	****	0.108	110	ug/ft²	100	930	ug/ft²	
12090014	Nor-W 12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090015	Nor-W 13	Flame	Wipe	****	0.108	110	ug/ft²	380	3600	ug/ft²	
12090016	Nor-W 14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090017	Nor-W 15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12090018	Nor-W 16	Flame	Wipe	****	0.108	110	ug/ft²	12	110	ug/ft²	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Norwich RC	**Chain Of Custody:**	513831
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Norwich, CT	**Date Submitted:**	8/30/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/6/2012 **Report Date:** 9/6/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analys Non-Responsive

Technical Manager: Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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Norwich RC
CTARNG

OWI (410) 247-2024 159202 210 REV. 6.08

513831

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Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires)

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: Norwich RC
2. Job Location: Norwich, CT
3. Job #: J12-1676 P.O. #: W912K6-09-A-0003
4. Contact Person: Non-Responsive
5. Submitted Non-Responsive

Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3-Day
☐ Next Day ☒ 5-Day + Date Due: 9/7/12
☐ 2 Day
☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Incl[ude] Non-Responsive ith Report ariaenviro.com
☒ Email: 5ang
☐ Fax: us.army.mil
☐ Verb us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)
PLM Bulk
☒ EPA 600 – Visual Estimate 2 (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)
TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted.
(TEM Water samples ℃)

Metals Analysis
☐ Pb Paint Chip (QTY) 2
☒ Pb Dust Wipe (wipe type 10cm) 16 (QTY)
☐ Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
	See attached Sheets															

CLIENT CONTACT
(LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 8/30/12 @ 1030 Via: FEDEX By (Print): Non-Responsive
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / / Initials:
4. Comments: 7987 2722 0170

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Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 8/22/12

Job Site: J12-676 Norwich RC (Armory)

Project No.: _____

Inspector: Non-Responsive

Sample No.	Sample Type	Sample Location	Dimensions (Area)
Nor-W01		Drill Hall - floor - center	10x10cm
Nor-W02		Drill Hall - floor near water fountain	
Nor-W03		Drill Hall - serving counter	
Nor-W04		Drill Hall - dining table	
Nor-W05		Drill Hall - floor rear overhead door	
Nor-W06		kitchen - prep table (smells so bad!)	
Nor-W07		kitchen - floor below prep table	
Nor-W08		entrance foyer to Drill Hall near IFR	
Nor-W09	former IFR	on brown painted bullet trap (slanted)	
Nor-W10	"	base of bullet trap	(painted floor and wall)
Nor-W11	"	1st cage floor (airlock) near bullet trap	
Nor-W12	"	~~2nd~~ front cage floor	
Nor-W13	"	top of flam cab in front of IFR	
Nor-W14	"	classroom - table top (computers)	
Nor-W15	"	Office (SSG) window sill (painted)	
Nor-W16	"	office (Ret.) corner sill	
Nor Bulk-02		Asbestos End cap Sealant Boots #2	
NOR-BULK-01	former IFR	Mastic Patty (Behind tectum)	

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Appendix C
Photo Documentation

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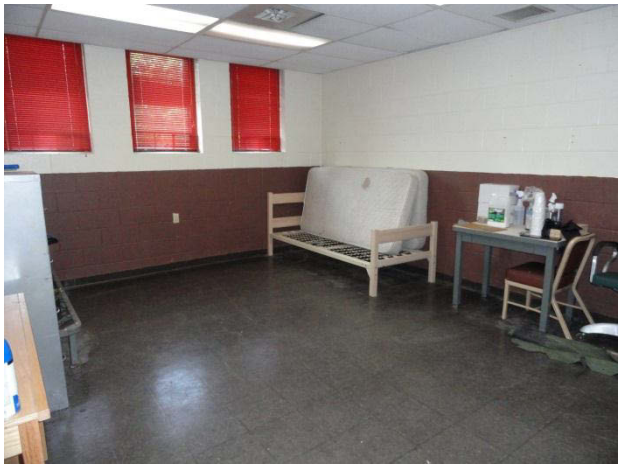
Norwich, CT Readiness Center

Drill Hall

Classroom



Office

Bunk Room

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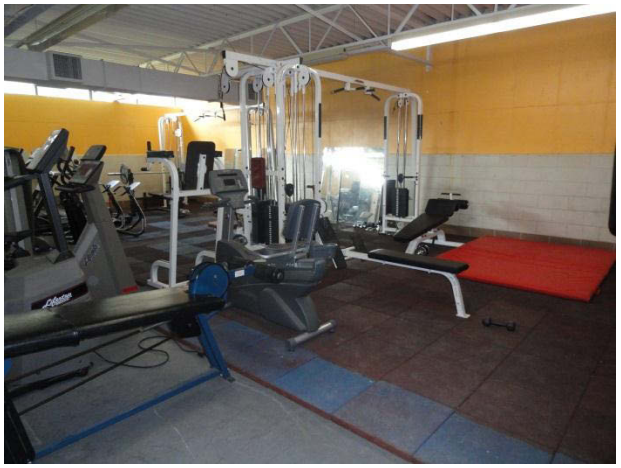
Norwich, CT Readiness Center

Empty Room



Fitness Center

Entrance to Drill Hall

Storage - Former Firing Range

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Norwich, CT Readiness Center

Flammable Storage

Storage on Bullet Trap

Former Firing Range

Small Boiler Room

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Norwich, CT Readiness Center

Fitness Center

Shower

Office

Maintainer's Office

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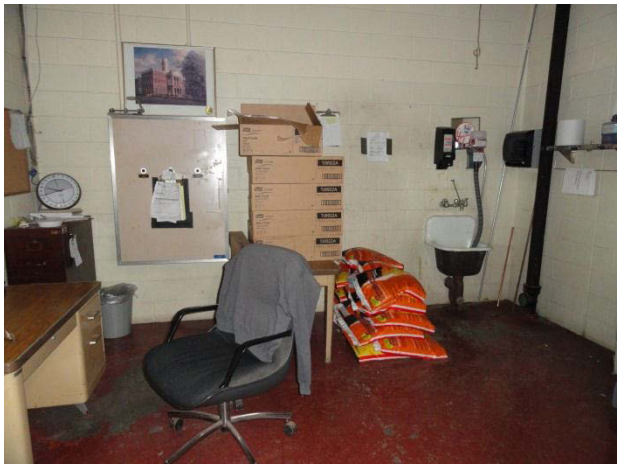
Norwich, CT Readiness Center



Maintainer's Office

Large Boiler Room

Storage Area

Storage Area

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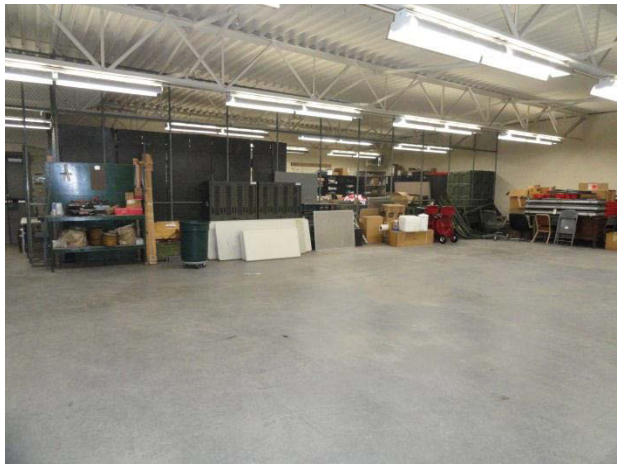
Norwich, CT Readiness Center



Large Storage Area

Kitchen

Kitchen

Flammable Storage

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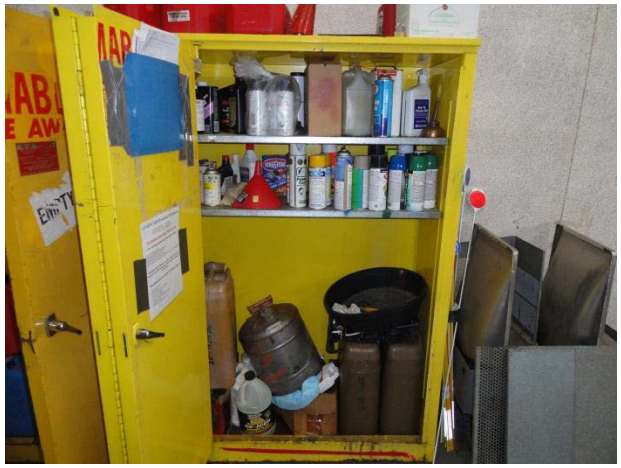
Norwich, CT Readiness Center



Flammable Storage

Flammable Storage

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Appendix D
IAQ and Lighting Survey Log Sheets

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	Norwich	IAQ							Light		
Date	8/22/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296					Serial Number		3021
Weather Conditions				Last Calibration		Mar-12					Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Drill Hall		2	11:54	73.7		58.4		440		0.6		15-68	X	50
Maintenance Office		1	11:55	73.2		62.4	X	486		0.3		45-52		30-50
Women's Latrine 1st Floor			11:58									15-51		5
Hall Near Vaults		1	11:59									10-54		5
Empty Arms Vault		1	12:00									11		10
Empty Arms Vault 2		1	12:01									12-15		10
Caged Area Storage		1	12:01	72.3	X	63.8	X	393		0.5		23-62		10
Large Boiler Room		1	12:03	72.6		63.9	X	443		0.3		25-50	X	30
Classroom 1st Floor		2	12:05	70.4	X	60.5	X	441		0.2		20-110	X	30-50
Break Room		2	12:07	68.0	X	56.0		387		0.1		18-70		10
NCO War Room		2	12:08	66.6	X	55.5		392		0.2		70-100		30-50
Office near Drill Hall		2	12:08									11-82		30-50
Storage/Indoor Firing Range		2	12:10									20-40	X	30
Small Boiler Room		2	12:10	75.1		61.6	X	404		0.1		30-60		30
Office Area		5	12:21	73.6		55.8		548		0.2		30-145		30-50
Server Room		1	12:23									80-90		30
Briefing Area Central Hall		2	12:28									17-55	X	30-50
Commander's Office		2	12:27	71.4	X	56.8		463		0.4		80-97		30-50
Retention Office		2	12:27	70.5	X	57.9		434		0.3		18-110	X	30-50
Hallway near Bath rooms		2	12:28									60		5
Female Latrine		2	12:29	71.6	X	60.2	X	465		0.1		30		5

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
PUTNAM ARMORY
PUTNAM, CONNECTICUT

October 2006
PN: 39741509

Non-Responsive

Office Manager

Non-Responsive

Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 663 of 1092

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TABLE OF CONTENTS

Section **Page**

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 664 of 1092

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TABLE OF CONTENTS (Cont)

APPENDICES

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 665 of 1092

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in all surveyed offices.	Increase lighting in the administrative areas this may be accomplished through use of task lighting. While work is in progress, the administrative area shall be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 666 of 1092

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Putnam Armory located at 15 Keech Street in Putnam, Connecticut. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On September 9, 2005, Mr. Non-Responsive, an industrial hygienist with URS, conducted a site visit to the Armory in Putnam, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Mr. Non-Responsive site contact for this survey.

This armory is a single-story building, with an attached drill hall, which is constructed primarily of brick and mortar. This facility is built on a concrete slab with a flat roof. Interior finishes include floor tile, suspended ceilings and drywall. The building was constructed in 1956. A drawing of the facility is attached in Appendix A.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 667 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning workstations at the time of this survey.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the drill hall, administrative area, and outside. These readings were all made using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 46% - 51% throughout the various building areas, with an average of 48.5%. The average reading was below the recommended maximum level of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from 480 to 525 parts per million (ppm), with an average of 502 ppm. The outside reading was 453 ppm.

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 668 of 1092

people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 453 ppm on the day of the survey, the ASHRAE limit would be 1,153 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 1 to 2 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 669 of 1092

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Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Foot Candles	Recommended Lighting Foot Candles
Training Office	Administrative	39	50
Conference Room	Administrative	49	50
Orderly Room	Administrative	46	50

On the day of the survey, lighting in all surveyed offices was inadequate.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues regarding the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in all of the surveyed offices. Personnel should supplement ambient light with task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 670 of 1092

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3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Bullet Trap	0909-10	10x10 cm	340	200
Bullet Trap	0909-11	10x10 cm	110	200
Top of cabinet	0909-12	10x10 cm	120	200
Fitness Firing End-Floor	0909-13	10x10 cm	68	200
Fitness window sill	0909-14	10x10 cm	23	200

Sample numbers and locations can be found on the site map in Appendix A.

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 671 of 1092

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Table 3-2
Airborne Concentration of Lead Dust

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	Lead Exposure Limit ($\mu g/m^3$)
Indoor Firing Range-Center	0909-02	214	<14	30.0

Sample numbers and locations can be found on the site map in appendix A.

On the day of the survey, the lead dust level in the former indoor firing range was found to exceed the NGB Region North Industrial Hygiene Office limit for lead in dust. The NGB has prepared a document entitled Recommendations for Surface Lead Dust in Armories (Appendix G).

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: One wipe sample collected from bullet trap in the firing range for lead was found to be above the allowable limit and requires cleaning and further testing. The NGB Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

The airborne lead dust levels in the former indoor firing range were found to be below the U.S. Army Medical Command's (MEDCOM) lead exposure limit for lead (National Guard Regulation 385-15, dated 30 December 2002) and OSHA action level of 30.0 $\mu g/m^3$ averaged over an 8-hour day.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 672 of 1092

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4.0 DRILL HALL

4.1 Operation Description

The drill hall is an 8,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a hard wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Outside Conference-Floor	0909-05	10x10 cm	5	200
Outside Recruiting-Floor	0909-06	10x10 cm	5.6	200
Outside Firing Range	0909-07	10x10 cm	9.6	200
Outside Bay Door	0909-08	10x10 cm	15	200
Outside Mess Hall-Floor	0909-09	10x10 cm	8.2	200

Table 4-2
Airborne Concentration of Lead Dust

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Action Level ($\mu g/m^3$)
Outside Boiler room	0909-01	120.3	<25	30.0
Field Blank	0909-03	N/A	<3	30.0

Sample numbers and locations can be found on the site map in Appendix A.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 673 of 1092

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4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be below allowable limits and require no cleaning or further testing. The NGB Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 674 of 1092

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5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

5.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 5-1 below shows the results of the lead sampling.

Table 5-1
Level of Lead Dust Found in the Boiler Room

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Top of electrical box	0909-18	10x10 cm	380	200

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

LEAD: The wipe sample collected from the Boiler Room for lead was found to be above allowable limits and requires cleaning and further testing. The NGB Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 675 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was found regarding hazard communication. Training records are maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 676 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15, 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 677 of 1092

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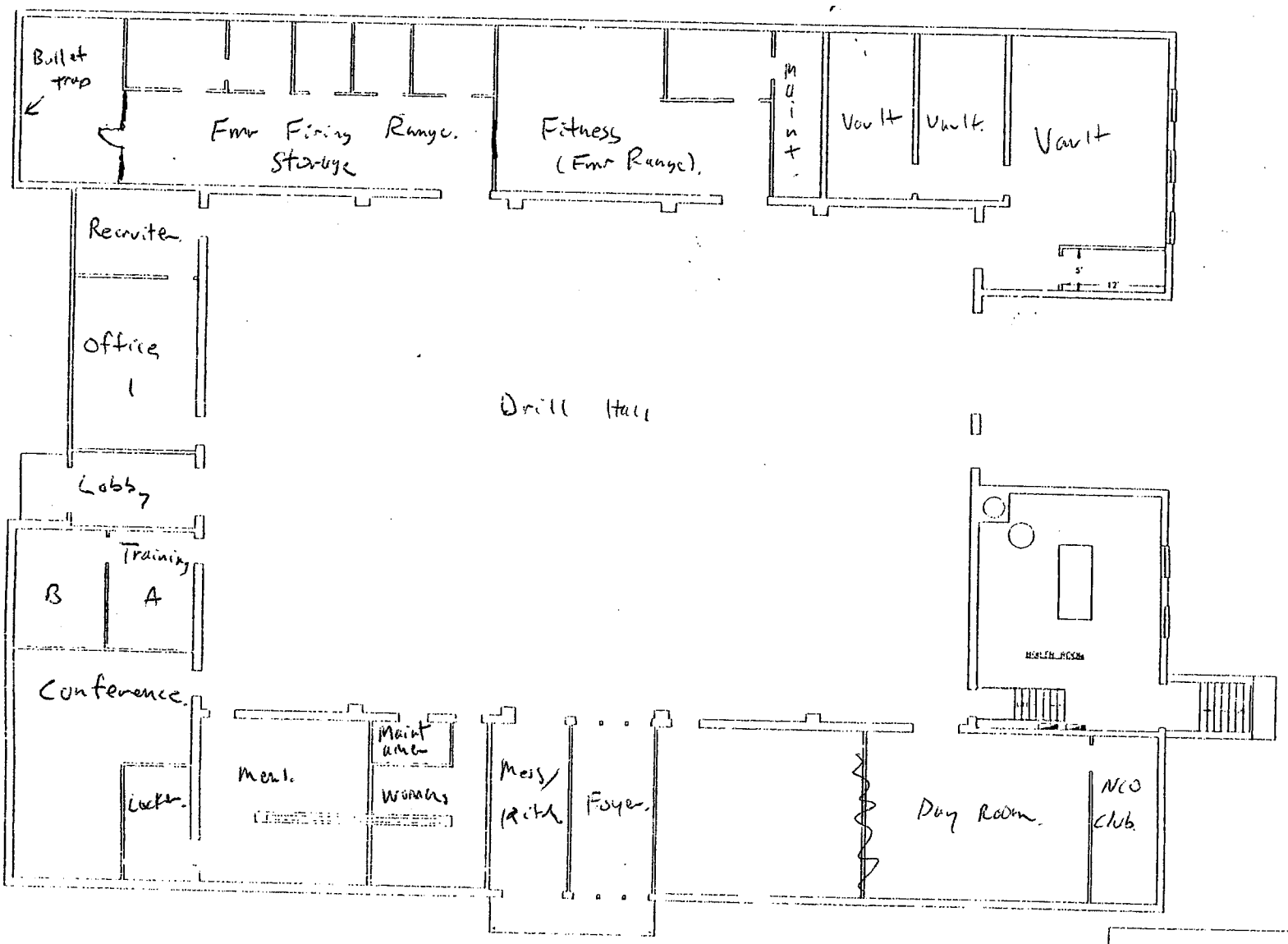
APPENDIX A

ARMORY DRAWING



PUTNAM ARMORY
KEECH STREET, PUTNAM, CONNECTICUT

CONSTRUCTION AND FACILITIES MANAGEMENT OFFICE
STATE ARMORY, 360 BROAD STREET, HARTFORD, CT 06105-3795

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APPENDIX B

PERSONNEL LIST

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PERSONEL LIST
PUTNAM ARMORY

Name	Title
Non-Responsive	Operation SGT
	Temp Tech
	Temp Tech
	Temp Tech
	Training NCO
	Supply NCO
	Recruiter

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APPENDIX C

HAZARDOUS MATERIALS LIST

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HAZARDOUS MATERIAL (1348-A1)

MSDS TAB	STOCK NUMBER	PRODUCT	SIZE	TYPE	QTY	DODACC	MSDS AVAILABLE
A-1	8010009108154	ENAMEL, ALKYD, BLK	16 OZ	AEROSOL	9		UNIT MSDS BOOK
A-2	8010068998825	PRIMER, ZINC, GREEN	16 OZ	AEROSOL	8		UNIT MSDS BOOK
A-3	8010007219751	LACQUER, ALUMINUM	QT	AEROSOL	2		UNIT MSDS BOOK
A-4	8030002441031	NEATS FOOT OIL	QT	LIQUID	19		UNIT MSDS BOOK
A-5	9150005297518	OIL, PENETRATING	16 OZ	AEROSOL	1		UNIT MSDS BOOK
A-6	6840010672137	INSECTICIDE	16 OZ	AEROSOL	1		UNIT MSDS BOOK
A-7	6840010676674	INSECTICIDE	12 OZ	AEROSOL	21		UNIT MSDS BOOK
B-1	8010002212809	VARNISH	QT	AEROSOL	1		UNIT MSDS BOOK
B-2	8010002236001	ENAMEL, PRIMER, UNDERCOAT	QT	LIQUID	2		UNIT MSDS BOOK
B-3	8010005151596	ENAMEL, ALKYD, GLOSS WHITE	QT	LIQUID	3		UNIT MSDS BOOK
B-4	8010002867758	ALKYD ENAMEL-YELLOW	QT	LIQUID	1		UNIT MSDS BOOK
B-5	P.N.08880	HIGH POWER BRAKE CLNR. WT	14 OZ	AEROSOL	9		UNIT MSDS BOOK
B-6	6810001237074	N-AMYL ACETATE	PT	LIQUID	2		UNIT MSDS BOOK
B-7	6810013822904	ISOPROPANAL	30 ML	LIQUID	30		UNIT MSDS BOOK
C-1	MQD-68	CEMENT EPOXY	GAL	LIQUID	2		STATE MSDS BOOK
C-2	31180400	POLYURETHAN ENAMEL	GAL	LIQUID	1		STATE MSDS BOOK
C-3	2651-01	ALKYD ENAMEL GREEN	GAL	LIQUID	1		STATE MSDS BOOK
C-4	7791	ALKYD URETHANE GLOSS ENAMEL-WALNUT	GAL	LIQUID	1		STATE MSDS BOOK
C-5	9150011029455	BRAKE FLUID, SILICON	GAL	LIQUID	2		UNIT MSDS BOOK
C-6	1002	THIN-X-BLUE	GAL	LIQUID	1		STATE MSDS BOOK
B-4	CLHCH	Carb cleaner	13 oz	Aerosol	1		
B-4	BLPMD	Kiwi Camp Dry	10.5 oz	Aerosol	1		

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FOIA Requested Record #15-0085 (CT)
Released by National Guard Bureau
Page 683 of 1092

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APPENDIX D

ANALYTICAL RESULTS

FOIA Requested Record #J-15-0085 (CT)
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09/28/2005 16:37 2027685106 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.633 007

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	15 Keech St Putnam CT	**Chain Of Custody:**	144196
Address:	301-BI Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	3974150900401	**Date Analyzed:**	9/28/2005 **Report Date:** 28-Sep-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0568365	090401	Flame	Air	120	N/A	25.00	ug/m³	< 25	ug/m³	
0568366	090402	Flame	Air	214	N/A	14.02	ug/m³	< 14	ug/m³	
0568367	090403	Flame	Air Blank	0	N/A	3.00	ug/m³	< 3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted]

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10/28/2005 10:53 9894 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.203 003

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Putnam Armory	**Chain Of Custody:**	145334
Address:	301-H Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Armory/Admin/Assembly	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	10/28/2005 **Report Date:** 28-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0604416	0909-15	Furnace	Wipe	****	0.108	2.79	ug/ft²	< 2.8	ug/ft²	
0604417	0909-16	Furnace	Wipe	****	0.108	2.79	ug/ft²	17	ug/ft²	
0604418	0909-17	Furnace	Wipe	****	0.108	2.79	ug/ft²	24	ug/ft²	
0604419	0909-18	Furnace	Wipe	****	0.108	69.70	ug/ft²	380	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] **Technical Manager:** [redacted]

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10/04/2005 15:08 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.774 005

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Putman Armory	**Chain Of Custody:**	144186
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Armory/Admin/Assembly	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	9/30/2005 **Report Date:** 03-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0568516	0909 04	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0568517	0909 05	Furnace	Wipe	****	0.111	2.70	ug/ft²	5	ug/ft²	
0568518	0909 06	Furnace	Wipe	****	0.111	2.70	ug/ft²	5.6	ug/ft²	
0568519	0909 07	Furnace	Wipe	****	0.111	2.70	ug/ft²	9.6	ug/ft²	
0568520	0909 08	Furnace	Wipe	****	0.111	2.70	ug/ft²	15	ug/ft²	
0568521	0909 09	Furnace	Wipe	****	0.111	2.70	ug/ft²	8.2	ug/ft²	
0568522	0909 10	Furnace	Wipe	****	0.111	67.51	ug/ft²	340	ug/ft²	
0568523	0909 11	Furnace	Wipe	****	0.111	67.51	ug/ft²	110	ug/ft²	
0568524	0909 12	Furnace	Wipe	****	0.111	67.51	ug/ft²	120	ug/ft²	
0568525	0909 13	Furnace	Wipe	****	0.111	67.51	ug/ft²	68	ug/ft²	
0568526	0909 14	Furnace	Wipe	****	0.111	2.70	ug/ft²	23	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

nical Manager: [redacted] Non-Responsive

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APPENDIX E

TRAINING CERTIFICATES

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Non-Responsive

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T-977 P 04/06 F-281

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Certificate of Training

[redacted] Non-Responsive

For successful completion of an 8 Hour, 1 Day

Asbestos Inspector & Management Planner
Annual Refresher Training
MARCH 25, 2003

This training was approved and given in accordance with Regulations for Connecticut State Agencies RCSA 20-440 - 1-9 and RCSA 20-441 and meets the requirements of the EPA Revised MAP under TSCA Title II of 4/4/94

Presented by

Mystic Air Quality Consultants, Inc.
1204 North Road, Groton, CT 06340 (800) 247-7746

Certificate Number: IMPR10543 Exam Grade: 100% Expiration Date: 03/25/2004
Exam Date: 03/25/2003

[redacted] Non-Responsive
H, CSP, RS

[redacted] Non-Responsive
Training Director

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Page 690 of 1092

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APPENDIX F

PHOTOGRAPHS

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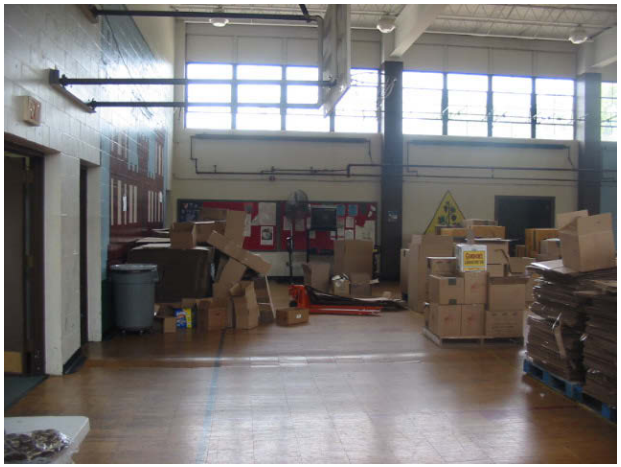

Photo 1:
Drill Hall Layout

Photo 2:
Drill Hall-Outside Boiler Room

Photo 3:
Range-Facing Bullet Trap

Photo 4:
Range-Bullet Trap

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Photo 5:
Fitness Center-Window Sill Wipe Location

Photo 6:
Fitness Center-Floor Wipe Location

Photo 7:
Drill Hall-Floor Damage

Photo 8:
Day Room-Loose Threshold

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Photo 9:
Boiler Room-Non ACM

Photo 10:
Boiler Room-Electrical Box

Photo 11:
Exterior-Front

Photo 12:
Exterior-Rear

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

FOIA Requested Record #J-15-0085 (CT)
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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15, 30 DECEMBER 2002)

FOIA Requested Record #J-15-0085 (CT)
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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

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Page 699 of 1092

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3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeters (cm) cellulose filter paper, Whatman #1 or equal

FOIA Requested Record #J-15-0085 (CT)
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Page 700 of 1092

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(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

FOIA Requested Record #J-15-0085 (CT)
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Page 701 of 1092

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b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Ealing and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

FOIA Requested Record #J-15-0085 (CT)
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Page 702 of 1092

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g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:
(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 703 of 1092

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b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 704 of 1092

BEST AVAILABLE COPY

NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program – POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 705 of 1092

BEST AVAILABLE COPY

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco, Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 706 of 1092

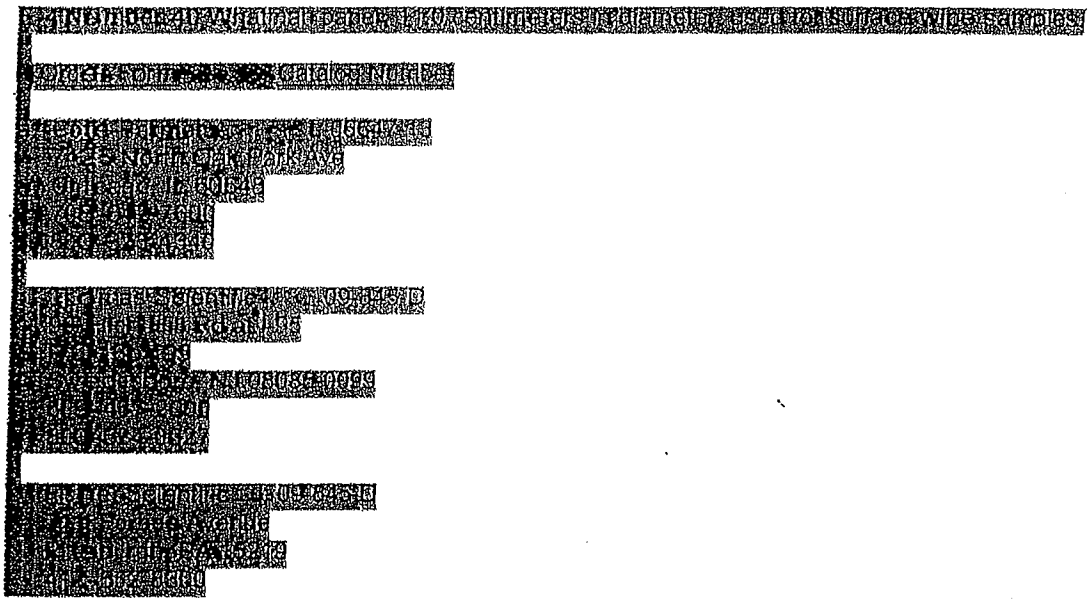
BEST AVAILABLE COPY

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472



E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From	Catalog Number
a. Pierce Chemical Co. P.O. Box 117 Rockford, IL 61105 815-968-0747 800-874-3723	13219 (screw cap)
b. Alltech Associates, Inc. Applied Science Labs 2051 Waukegan Rd. Deerfield, IL 60015 312-948-8600	95321 (screw cap)

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 707 of 1092

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 — Centimeters squared

Sq ft — Square foot

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 708 of 1092

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APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address	Point of Contact *(name & phone #)*
	Samples Collected By

Sampled Facility	City	State	Location *(bldg/area)*

Description of Operation	Date Collected	Date Shipped

Analysis Desired

Sampling Data

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 709 of 1092

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address	Point of Contact *(name/phone #)*
	Samples Collected By

Sampled Facility	City	State	Location *(bldg/area)*

Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection

Analysis Desired

Sampling Data

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer

Comments to Lab:

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 710 of 1092

BEST AVAILABLE COPY

APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 711 of 1092

BEST AVAILABLE COPY

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 712 of 1092

BEST AVAILABLE COPY

URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, Connecticut 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
ROCKVILLE ARMORY
ROCKVILLE, CONNECTICUT

September 2006
PN: 39741509

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 713 of 1092

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TABLE OF CONTENTS

Section **Page**

BEST AVAILABLE COPY

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 714 of 1092

BEST AVAILABLE COPY

TABLE OF CONTENTS (Cont)

APPENDICES

BEST AVAILABLE COPY

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 715 of 1092

BEST AVAILABLE COPY

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lead		
Lead was detected in wipe samples collected from the firing range and the drill hall in amounts greater than or equal to 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean areas where lead was detected in quantities of greater than or equal to 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 3
Hazard Communication		
A site specific hazard communication plan was not available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Asbestos		
A site specific asbestos operations and maintenance plan available, however there were no training records available and labeling of installed asbestos-containing materials has not been completed.	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j)	RAC 3

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 716 of 1092

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Rockville Armory located at 120 West Street in Rockville, Connecticut 06066. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On July 28, 2005, Ms. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Rockville, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Ms Non-Responsive site contact for this survey.

This armory is a single-story brick building, with an attached drill hall, that is constructed primarily of brick and mortar. This facility is built on a concrete slab. A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 717 of 1092

BEST AVAILABLE COPY

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. This is particularly true for part time employees. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning workstations at the time of this survey.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the administrative area and outside. These readings were all measured using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey was measured at 58.1 % throughout the various building areas. This reading was below the maximum level of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations was measured at 539 parts per million (ppm). The outside reading was 470 ppm.

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 718 of 1092

BEST AVAILABLE COPY

people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 470 ppm on the day of the survey, the ASHRAE limit would be 1,170 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 2 to 3 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting).

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 719 of 1092

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (foot candles)	Recommended Lighting (foot candles)
Classroom	Administrative	35	50
Gym	Administrative	31	50
Small Kitchen	Administrative	29	50
Large Kitchen	Administrative	48	50
Briefing Room	Administrative	36	50
CDR	Administrative	10	50
1 SG	Administrative	79	50
Orderly Room	Administrative	68	50
Mobs & RDNS office	Administrative	57	50

2.2.5 Lead

Wipe testing for lead dust was conducted in the administration area using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 2-2 below shows the results of the lead sampling.

Table 2-2
Levels of Lead Dust Found in the Administration Area

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Men's Latrine-Window Sill	RWS-01	10x10 cm	3.4	200
CDR Office- Window Sill	RWS-02	10x10 cm	10	200
Training Office-Bookcase	RWS-03	10x10 cm	25	200

Sample numbers and locations can be found on the site map in Appendix A.

2.3 Ventilation System Evaluation

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 720 of 1092

BEST AVAILABLE COPY

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in two thirds of the offices and generally throughout the facility. URS recommends increasing the area lighting or supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 721 of 1092

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3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The former indoor firing range is currently used for an anti-armor platoon classroom and storage area.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead dust was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Indoor Firing Range

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Anti Armor Platoons Classroom-Locker	FR-01	10x10 cm	26	200
Anti Armor Platoons Classroom-Locker	FR-02	10x10 cm	13	200
Anti Armor Platoons Classroom-Floor	FR-03	10x10 cm	58	200
Anti Armor Platoons Classroom-Floor	FR-04	10x10 cm	36	200
Anti Armor Platoons Classroom-Floor	FR-05	10x10 cm	200	200

One air sample for lead dust was also collected in the Former Indoor Firing Range. Table 3-2 below shows the result of this air sample.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 722 of 1092

BEST AVAILABLE COPY

Table 3-2
Airborne Concentration of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Permissible Exposure Limit ($\mu g/m^3$)
Former Firing Range Center	Air-01	180	<17	50

Sample number and location can be found on the site map in Appendix A.

On the day of the survey, the airborne lead dust level in the former indoor firing range was found to be below the OSHA permissible exposure limit of 50 $\mu g/m^3$ averaged over an 8-hour day.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: A dust wipe sample collected from the former indoor firing range was found to contain a lead level of 200 micrograms/ square foot. This is the maximum level recommended by the NGB Region North Industrial Hygiene Office (Appendix E). This area should be cleaned in accordance with OSHA's lead standard (29 CFR1910.1025 and 1926.62). Guidelines for the cleanup and rehabilitation of indoor firing ranges is provided in Appendix G.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 723 of 1092

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a hard wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall, Electric Panel O/S Kitchen	DH-06	10x10 cm	420	200
Drill Hall, Floor O/S Broom Closet	DH-07	10x10 cm	92	200
Drill Hall, Cabinets O/S Storage	DH-08	10x10 cm	22	200
Drill Hall Floor O/S Common Room	DH-09	10x10 cm	98	200
Drill Hall, Boiler Shut Off Box	DH-10	10x10 cm	190	200

Sample numbers and locations can be found on the site map in Appendix A.

4.3 Ventilation System Evaluation

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 724 of 1092

BEST AVAILABLE COPY

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: One dust wipe sample collected from the Drill Hall was found to contain lead above 200 micrograms/ square foot. This is the maximum level recommended by the NGB Region North Industrial Hygiene Office (Appendix F). This area should be cleaned in accordance with OSHA's lead standard (29 CFR1910.1025 and 1926.62).

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 725 of 1092

BEST AVAILABLE COPY

5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

5.2.1 Asbestos

Asbestos-containing pipe insulation was observed to be damaged in the boiler room.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

ASBESTOS: Asbestos-containing pipe insulation in the boiler room was observed to be damaged and should be repaired.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 726 of 1092

BEST AVAILABLE COPY

6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was not found regarding hazard communication. Training records are maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 727 of 1092

BEST AVAILABLE COPY

7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

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Page 728 of 1092

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APPENDIX A

ARMORY DRAWING

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B Co 242d ENGR / ROCKVILLE ARMORY

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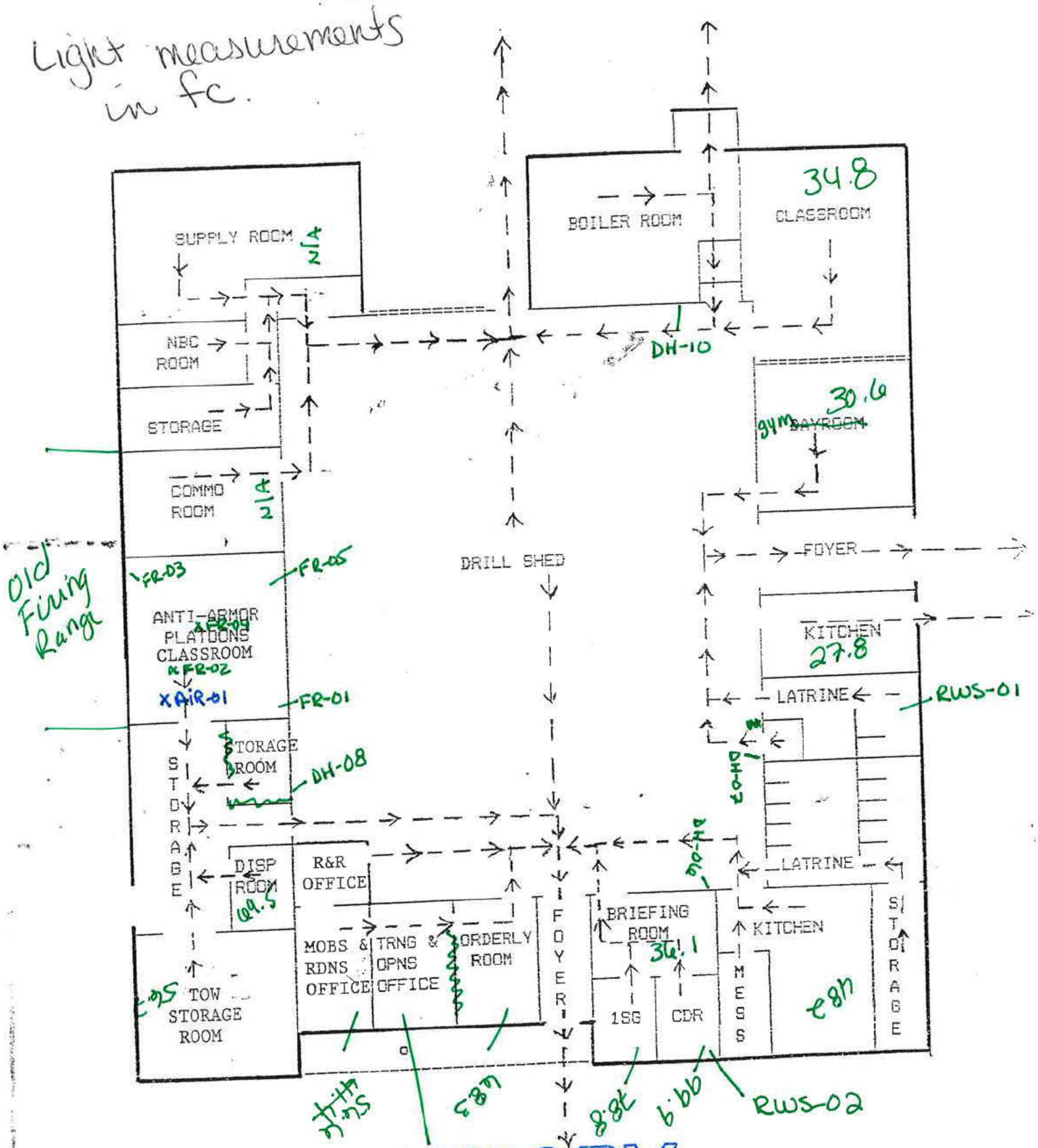
FIRE/EMERGENCY EVACUATION PLAN

Light measurements in fc.



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APPENDIX B

PERSONNEL LIST

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APPENDIX C

HAZARDOUS MATERIALS LIST

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HAZARDOUS MATERIAL INVENTORY LIST

as of 24OCT97

DRILL SHED FLOOR, CUSTODIAN CLOSET

MSDS STOCK #	NOMENCLATURE	NSN	SIZE	QUANTITY
1	WHITE AMMONIA, HOUSEHOLD,		QT	
2	BLEACH	00-900-6276 00-598-7316	5-GALL 1-GALL	
92	FAST & EASY SPRAY CLEANER		QT	
95	SPRITZ SPRAY & BUFF		GALL	
96	AMBICIDE # 85		5-GALL	
97	NEUTRABRITE FLOOR CLEANER		5-GALL	
100	CLINDO 101 GLASS CLEANER		19 OZ CAN	
409	SOAP, SCOURING POWDER	01-294-1115 01-294-1116	1 LB CAN	
452	FLOOR WAX, CRYSTAL	00-926-1689	5-GALL	
453	FLOOR WAX, #55	NO NSN	GALL	
152	Sodrant powder - carpet Bug powder		1 can	

MSDS BOOK LOCATED IN RNCO ORDERLY ROOM

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Hazardous Material Inventory List

Dec 17, 2003 -

CABINET #1

9150-00-186-6668	OE-HD-10 LUBE OIL-ENGINE	5 GAL	10 GAL	10GAL
9150-00-152-4118	OE-HD-15/40 LUBE OIL-ENGINE	5 GAL	15 GAL	5 GAL
9150-01-035-5393	GO 80W90-LUBE OIL-GEAR	5 GAL	5 GAL	10 GAL
6810-00-297-9540	WATER,BATTERY	5 GAL	10 GAL	10GAL
9150-01-351-9019	LUBE OIL-ENGINE	1 QT	7 QTS	—
9150-01-353-4799	HYDRAULIC FLUID-TRANSMISION	1 QT	3 QTS	— 2 QTS
9150-01-178-4725	LUBE OIL-15/40	1 QT	1QT	5GAL

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CABINET #2

Hazardous Material Inventory List

NOV. 17, 2002

9150-01-053-6688	BREAK FREE	1 GAL	1 GAL	—
9150-00-753-4686	LUBE OIL- SEMI FLUID	1 GAL	2 GAL	—
8030-01-350-4984	SYNATANE-SEALING COMP.	1 GAL	2.GAL	1GAL
9150-01-197-7688	GAA- TUBE	2 1/4 OZ	5 TUBES	—
9150-01-260-2534	LUBE SOLID FILM	16 OZ	5 CANS	3 CANS
8010-00-584-2426	PRIMER COAT-YELLOW	10.5 OZ	1	—
7510-00-183-7698	INK MARKING, STENCIL-YELLOW	10.5 OZ	1	—
9150-01-~~351-9010~~ 438-6076	15/40 LUBE OIL	1 QT	1	2
9150-00-117-8791	LUBE OIL 2 CYCLE	1 PT	1BX 11 PTS	—
9150-01-197-7689	GAA-CAN	1GAL	4 GAL	—
9150-01-035-5393	80/90 LUBE OIL	5GAL	10 GAL	—
9150-01-178-4725	15/40 OE HDO	1QT	7 QTS	—
6850-00-926-2275	Cleaning Compound	1 Opint	12 pints	—
6850-01-167-0678	Brakleen	15oz	6ea 15oz	ONE
	Starting Fuild	11oz	1ea 11oz	—
	Engine Gunk	16oz	1ea 16oz	one
7510-00-469-7910	INK MARKING STENCIL OPAQUE	10.5oz		9CANS
#?	LUBE OIL 2-CYCLE (POULAN)	8.0Z		4
	PENETRATING OIL	19¾ OZ		one
6850-00-281-1985	DRY CLEANING SOLVENT	1GAL		1GAL
6810-00-597-3608	METHANOL GRADE "A"	1GAL		1GAL
6850-00-926-2275	CLEANING COMPOUND WINDSHIELD	1 PINT		9PINTS
[illegible]		1		[illegible]
9150-01-438-6082	LUBE OIL ENGINE 15W40	5GAL		10GAL
	COOLANT ANTI-FREEZE	5GAL		5GAL

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ENGINE #3

Hazardous Material Inventory List

NOV 17, 2002

6850-00-281-1985	DRY CLEANING SOLVENT	1 GAL	1 GAL	—
9150-01-102-9455	BRAKE FLUID-SILICONE	1 GAL	3 GALS	2GAL
9150-01-197-7692	GAA	5 GAL	25 GALS	20GAL
8030-00-251-5048	CORROSION PREV. COMPOUND	1 GAL	2 GAL	2GAL
9150-01-466-7536	LUBE OIL ENGINE 30 GRADE	5GAL		5GAL
9150-01-438-6082	LUBE OIL ENGINE 15W40	5GAL		5GAL
9150-01-197-7689	GAA	6.5lbs.		19.5lbs
9150-00-117-8791	LUBE OIL 2 CYCLE	1 PINT		17PINTS
9150-01-197-7693	GAA	14 oz.		42 oz.
4930-00-253-2478	LUBEGUN HAND OPERATED	ONE		4
9150-01-197-7688	GAA TUBE	2¼ oz.		3tubes
9150-01-438-6076	LUBE OIL ENGINE	1QT		12QT
9150-00-753-4686	LUBE OIL SEMI-FLUID	1GAL		2GAL

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APPENDIX D

ANALYTICAL RESULTS

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Page 738 of 1092

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Rockville Armory	**Chain Of Custody:**	141923
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Vernon, CT	**Date Submitted:**	8/12/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	8/19/2005
Attention:	[redacted]			**Report Date:**	19-Aug-05

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0559059	Air-01	Flame	Air	180	N/A	16.67	ug/m³	< 17	ug/m³	
0559060	FR-01	Furnace	Wipe	****	0.108	2.79	ug/ft²	26	ug/ft²	
0559061	FR-02	Furnace	Wipe	****	0.108	2.79	ug/ft²	13	ug/ft²	
0559062	FR-03	Furnace	Wipe	****	0.108	13.94	ug/ft²	58	ug/ft²	
0559063	FR-04	Furnace	Wipe	****	0.108	13.94	ug/ft²	36	ug/ft²	
0559064	FR-05	Furnace	Wipe	****	0.108	69.70	ug/ft²	200	ug/ft²	
0559065	DH-06	Furnace	Wipe	****	0.108	69.70	ug/ft²	420	ug/ft²	
0559066	DH-07	Furnace	Wipe	****	0.108	13.94	ug/ft²	92	ug/ft²	
0559067	DH-08	Furnace	Wipe	****	0.108	2.79	ug/ft²	22	ug/ft²	
0559068	DH-09	Furnace	Wipe	****	0.108	13.94	ug/ft²	98	ug/ft²	
0559069	DH-10	Furnace	Wipe	****	0.108	69.70	ug/ft²	190	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Technical Manager: [redacted]

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Page 739 of 1002 02/61/80

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A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	145335
Address:	301-111 Old Bay Lane, Attn: NGB-AVN-SI. State Military Reservation	**Job Location:**	Armory	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	11/9/2005

Report Date: 09-Nov-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0604311	RWS-01	Furnace	Wipe	****	0.108	2.79	ug/ft²	3.4	ug/ft²	
0604312	RWS-02	Furnace	Wipe	****	0.108	2.79	ug/ft²	10	ug/ft²	
0604313	RWS-03	Furnace	Wipe	****	0.108	2.79	ug/ft²	25	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive **Technical Manager:** [redacted] Non-Responsive

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Page 740 of 1092

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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APPENDIX E

TRAINING CERTIFICATES

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May-26-05 01:17pm From-URS CORPORATION BEST AVAILABLE COPY T-317 P.02/02 F-076

CERTIFICATE OF ACHIEVEMENT

This certifies that

[redacted] Non-Responsive

has successfully completed the

Asbestos Site Inspector Refresher Training
Asbestos Accreditation Under TSCA Title II
40 CFR Part 763

conducted by

ATC Associates Inc.
73 William Franks Drive
West Springfield, MA 01089
(413) 781-0070

[redacted] Non-Responsive

May 26, 2005
Date of Course

May 26, 2006
Expiration Date

[redacted] Non-Responsive

SIAR-1938
Certificate Number

May 26, 2005
Examination Date

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Page 742 of 1092

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APPENDIX F

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building,

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APPENDIX G

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15 30 DECEMBER 2002)

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose

1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References

Related publications are listed below.

a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

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Page 747 of 1092

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3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman #41 paper

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 748 of 1092

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(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 749 of 1092

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b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 750 of 1092

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g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment

For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping

This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance

The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 751 of 1092

BEST AVAILABLE COPY

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 752 of 1092

BEST AVAILABLE COPY

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 753 of 1092

BEST AVAILABLE COPY

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 754 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From	Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 755 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 756 of 1092

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APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address		Point of Contact *(name & phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			
Sampling Data			

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 757 of 1092

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 758 of 1092

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APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 759 of 1092

BEST AVAILABLE COPY

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 760 of 1092

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Industrial Hygiene Survey

Connecticut Army National Guard (CT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Rockville Readiness Center
120 West Street
Rockville, CT 06066

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: August 21, 2012

AEI Project #: J12-676 3h CT Rockville RC

_____

Non-Responsive, **CIH, CSP, LEED Green Associate**
Industrial Hygienist

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 761 of 1092

Table of Contents

List of Tables and Appendices

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 762 of 1092

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) Rockville Readiness Center located at 120 West Street, Rockville, CT 06066. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 21, 2012. The points of contact for the facility were SSG Non-Responsive and the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the floor in the Supply Room. A paint chip sample was analyzed and found to be less than 0.5% lead by weight which is not considered lead-based paint. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot ($\mu g/ft^2$)) in all areas sampled except for samples collected from a flammable storage cabinet in the Drill Hall and from the floor in two areas of the Supply Room.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Some areas of the Drill Hall's parquet floor with black mastic are damaged. A bulk sample of the black mastic was collected and submitted for analysis. No asbestos was detected in the sample.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable with room for improvement. Some areas were being prepared for renovation.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 13 foot candles (fc) to over 175 fc.

Indoor Air Quality: Temperature measurements were acceptable or slightly above the comfort ranges for the summer season, and relative humidity measurements were within the comfort ranges on the day of the survey. The outdoor temperature and relative humidity were 80.5° F and 40.8% on the day of monitoring, and indoor conditions were similar to outdoor conditions. The facility has window air-conditioning units in some areas. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide were below the recommended concentrations in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available; however, MSDSs were readily available and up to date as required by the Occupational Safety and Health Administration (OSHA) standard 29

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 763 of 1092

CFR 1910.1200. It is recommended that a copy of the written hazard communication program and any related training records be placed in every MSDS notebook.

Overall, the Rockville Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 764 of 1092

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CT ARNG) Rockville Readiness Center located at 120 West Street, Rockville, CT 06066. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 21, 2012. The points of contact for the facility were SSG Non-Responsive and the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Rockville Readiness Center was built in the 1950-60's. The readiness center is staffed by 3 National Guard administrative personnel, 1 civilian caretaker (maintainer) and a family readiness administrator. The operations conducted at the facility include supply and administrative duties and include the 102nd Army Band. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Rockville Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Rockville facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state employed maintainer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 765 of 1092

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for damaged building materials that may contain asbestos or lead-based paint, for water damage or mold problems; for potential ergonomic problems; and for housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the floor in the supply room. A paint chip sample was collected and submitted for lead analysis. Results are given in Table 1 and certificates of analysis are included in Appendix B. The paint on the floor was below 0.5% lead by weight and is not considered lead-based paint.

Table 1 – Results of Paint Chip Sampling for CTARNG Rockville Readiness Center on August 21, 2012.

Sample #	Sample Location	Lead Result (% by wt)
Rock-Bulk-02	Gray paint on floor in Supply Room	0.017

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the state of Connecticut limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical Services, Inc. (AMA) of Lanham, MD for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Wipe samples collected from the facility were above the recommended maximum level for surface contamination in three of the twelve wipe samples: from a flammable storage cabinet in the Drill Hall and from the floor in two areas of the Supply Room. Surfaces contaminated with lead dust should be cleaned using wet methods or high efficiency particulate air (HEPA)-filtered vacuums. Results are given in Table 2 and certificates of analysis are included in Appendix B.

Table 2 – Results of Dust Wipe Sampling for CTARNG Rockville Readiness Center on August 21, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
Rock-W01	Drill Hall – top of flammable storage cabinet	**7,000**
Rock-W02	Drill Hall – floor under basketball hoop	<110
Rock-W03	Drill Hall – top of book shelf	180

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 766 of 1092

Table 2 – Results of Dust Wipe Sampling for CTARNG Rockville Readiness Center on August 21, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
Rock-W04	Drill Hall – floor near bay door	<110
Rock-W05	Drill Hall – fitness bench	<110
Rock-W06	Supply Room – floor	**450**
Rock-W07	Rear Supply Room – floor	**1,000**
Rock-W08	Men's locker room – floor	130
Rock-W09	Hall outside break room – floor	160
Rock-W10	Break room – right ledge of concrete wall (former firing range) (carpeted)	120
Rock-W11	Break room – left ledge of concrete wall (former firing range) (carpeted)	<110
Rock-W12	Drill Hall –brown painted wooden tables	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft^2) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged parquet flooring with black mastic was observed in the drill hall. Samples of the black mastic were submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. No asbestos was detected in the black mastic sample.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable with room for improvement. Some areas were preparing for a renovation.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 767 of 1092

from 13 foot candles (fc) to over 175 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 3. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 3 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 76.4 to 81.2° F and 43.0 to 55.3% Rh. Temperatures were mostly acceptable or slightly above the summer comfort ranges, and relative humidity measurements were within the comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 80.5° F and 40.8%, and conditions inside were similar to the outdoor conditions. This readiness center has window air-conditioning units in some areas.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 373 to 729 parts per million (ppm). The outdoor CO_2 concentration was 382 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 768 of 1092

TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.0 to 0.2 ppm; therefore all measurements were below the concentrations of concern.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program and any related training records be placed in every MSDS notebook.

7 Conclusions

The results of the evaluation indicated a few minor concerns at the facility. Overall, the Rockville Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 769 of 1092

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6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 770 of 1092

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Appendix A
Building Layout

FOIA Requested Record #J-15-0085 (CT)
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ROCKVILLE ARMORY

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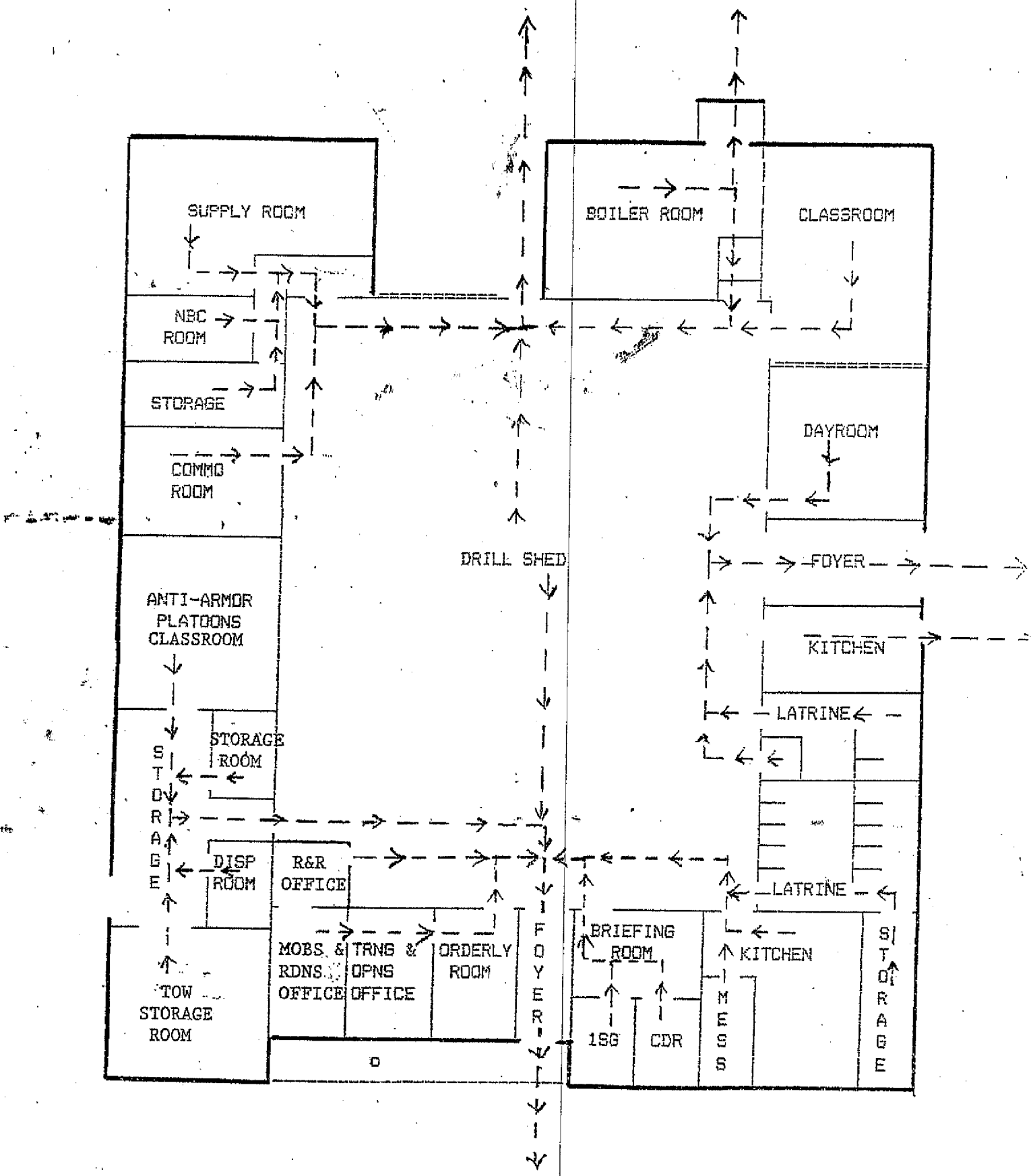
FIRE/EMERGENCY EVACUATION PLAN



FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 772 of 1092

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Appendix B
Certificates of Analysis

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Rockville RC	**Chain Of Custody:**	513791		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Rockville, CT	**Date Submitted:**	8/30/2012		
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/5/2012	**Report Date:**	9/5/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
12089786	ROCK W 01	Flame	Wipe	****	0.108	110	ug/ft²	750	7000	ug/ft²	
12089787	ROCK W 02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089788	ROCK W 03	Flame	Wipe	****	0.108	110	ug/ft²	19	180	ug/ft²	
12089789	ROCK W 04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089790	ROCK W 05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089791	ROCK W 06	Flame	Wipe	****	0.108	110	ug/ft²	48	450	ug/ft²	
12089792	ROCK W 07	Flame	Wipe	****	0.108	110	ug/ft²	110	1000	ug/ft²	
12089793	ROCK W 08	Flame	Wipe	****	0.108	110	ug/ft²	15	130	ug/ft²	
12089794	ROCK W 09	Flame	Wipe	****	0.108	110	ug/ft²	17	160	ug/ft²	
12089795	ROCK W 10	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
12089796	ROCK W 11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089797	ROCK W 12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089798	ROCK Bulk 02	Flame	Paint Chip	****	N/A	0.007	%Pb		0.017	%Pb	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Rockville RC	**Chain Of Custody:**	513791
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Rockville, CT	**Date Submitted:**	8/30/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/5/2012
				Report Date:	9/5/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Anal Non-Responsive

Technical Manager Non-Responsive

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Rockville RC	**Chain Of Custody:**	513791
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Rockville, CT	**Date Analyzed:**	9/5/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12089799	ROCK Bulk 01	NAD	--	--	--	--	--	--	5	--	--	95	MS	Black	Homogeneous	LBP	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Director Non-Responsive **Analyst(s)** Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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Page 776 of 1092

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OWI (410) 247-2024

Rockville RC CTARNG 151202

210 REV. 6.08

513791

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires)

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: Rockville RC
2. Job Location: Rockville, CT
3. Job #: 513-676 P.O. #: W912K8-09-A-0003
4. Contact Pers: Non-Responsive (Non-Responsive)
5. Submitted b: Signature

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
- ☐ Immediate Date Due:
- ☐ 24 Hours Time Due:
- Comments:

NORMAL BUSINESS HOURS
- ☐ Immediate
- ☐ Next Day
- ☐ 2 Day
- ☐ 3 Day
- ☒ 5 Day + Date Due: 9/7/12
- ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
- ☒ Include COC/Field Data Sheets with Report
- ☒ Email: Non-Responsive aria-envtro.com
- ☐ Fax: us.army.mil
- ☐ Verbal: us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 1 (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area) Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
- ☐ Pb Paint Chip (QTY) 1
- ☐ Pb Dust Wipe (wipe type 10 cm²) 12 (QTY)
- ☐ Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples:
Collection Media:
- ☐ Spore-Trap (QTY)
- ☐ Surface Swab (QTY)
- ☐ Surface Tape (QTY)
- ☐ Other (Specify) (QTY)
- ☐ Surface Vacuum Dust (QTY)
- ☐ Culturable ID Genus (Media) (QTY)
- ☐ Culturable ID Species (Media) (QTY)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA

See attached Sheet

ANALYSIS / **MATRIX**

TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WIPE AND OTHER	SPORE TRAP	TAPE	SWAB

CLIENT CONTACT

(LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 8/30/12 @1030 Via: FEDEX By (Print): Non-Responsive
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Date: / / Time: Initials:
4. Comments:

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Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 8/21/12

Inspecto [redacted] Non-Responsive

Job Site: J12-676 ~~Rockville RC~~

Project No.: _____ Rockville RC

Sample No.	Sample Type	Sample Location	Dimensions (Area)
Rock-W01	Lead	Drill Hall – top of floor lab	dusty 10'x10'
Rock-W02		Drill Hall – under basketball	hoop (floor)
Rock W03		Drill Hall – bookshelf (parts)	dusty
Rock W04		Drill Hall – near bay doors (floor)	
Rock W05		Drill Hall – fitness bench	
Rock W06		Supply Room – floor	
Rock W07		Supply Room (rear) – floor	(red + gray paint)
Rock W08		Mens Locker room – floor	
Rock W09		Outside of former IFR floor	
Rock W10		Break Room (former IFR)	(left) wall (right)
Rock-W11		" " "	(left)
Rock-W12		Drill Hall brown painted	wooden tables (break area)
Rock bulk-01	–	asbestos	black mastic parquet drill hall floor
Rock bulk-02	–	lead	gray paint

odors in locker room

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Page 778 of 1092

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Appendix C
Photo Documentation

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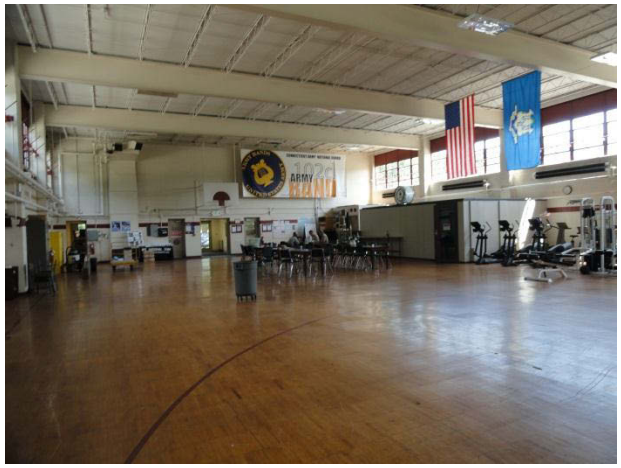
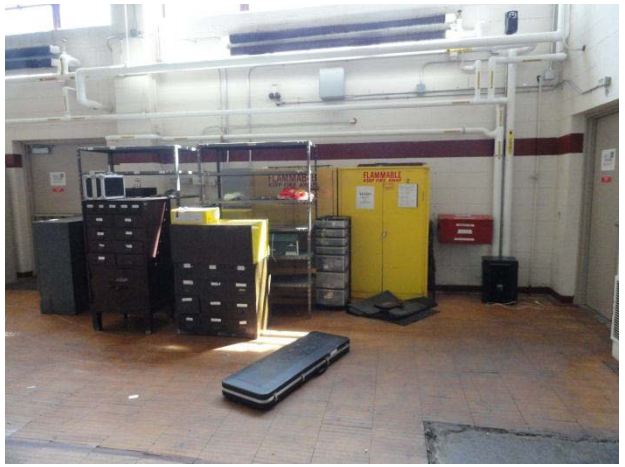
Rockville, CT Readiness Center



Drill Hall

Drill Hall

Damaged parquet floor



Drill Hall

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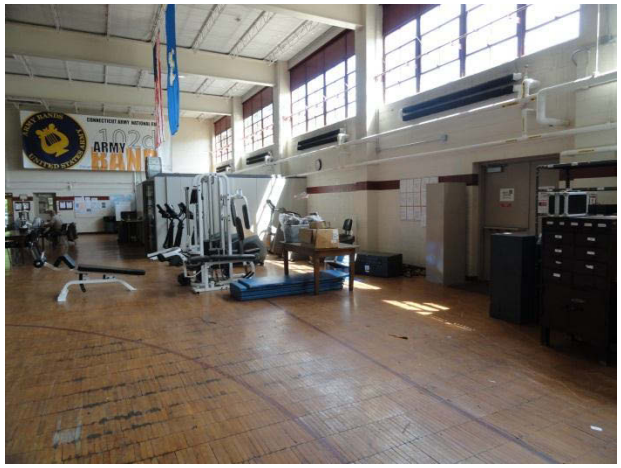
Rockville, CT Readiness Center



Fitness Area

Drill Hall

Former Kitchen under renovation

Latrine

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Rockville, CT Readiness Center

Storage Room

Cleaning Products

Custodial closet

Locker Room

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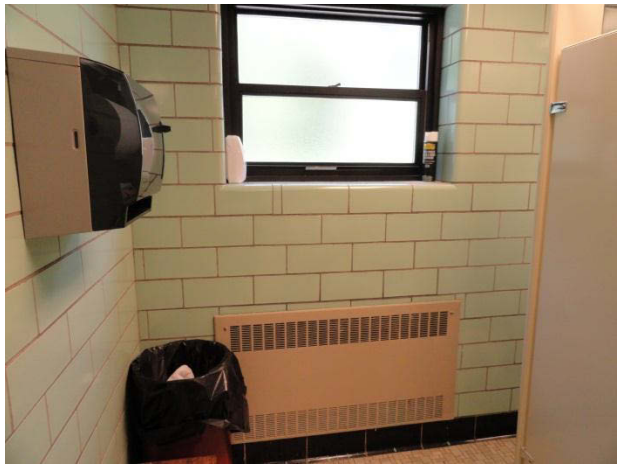
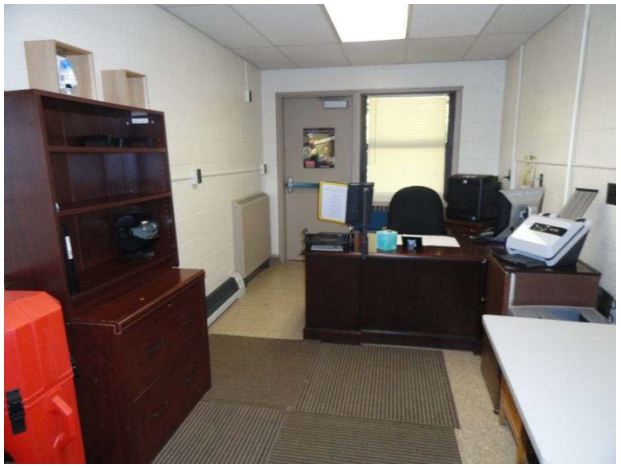
Rockville, CT Readiness Center



Latrine



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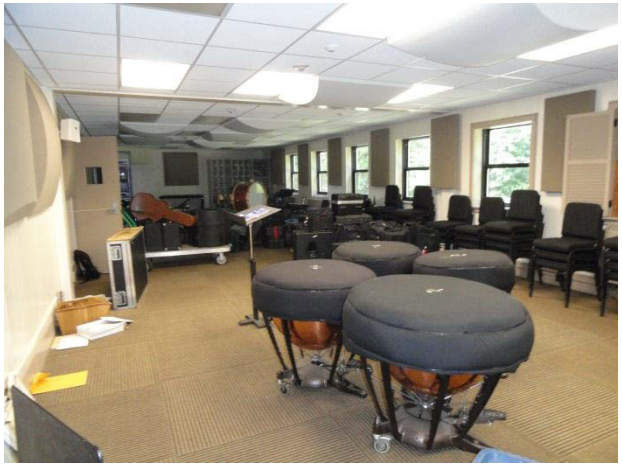

Band Room with sound proofing

Boiler Room

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Rockville, CT Readiness Center

Small Shop in Boiler Room

Laundry in Boiler Room

Boiler Room

Storage in Boiler Room

FOIA Requested Record #J-15-0085 (CT)
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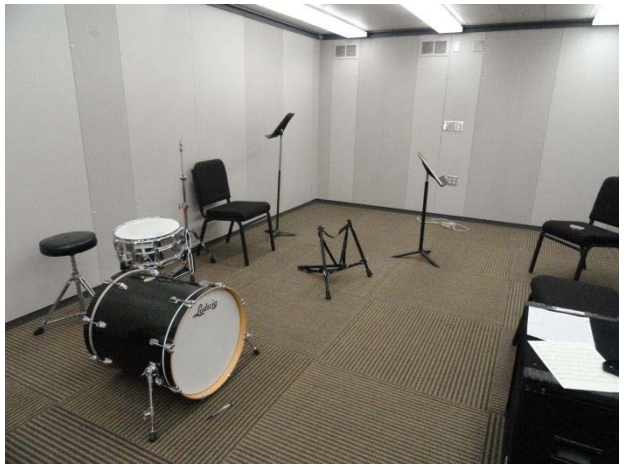
Rockville, CT Readiness Center

Supply Room –peeling paint on floor

Back Supply Room

Music Library



Mobile Band Room

FOIA Requested Record #J-15-0085 (CT)
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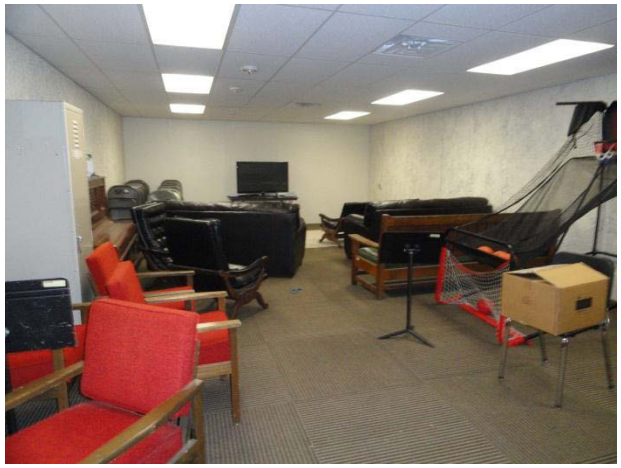
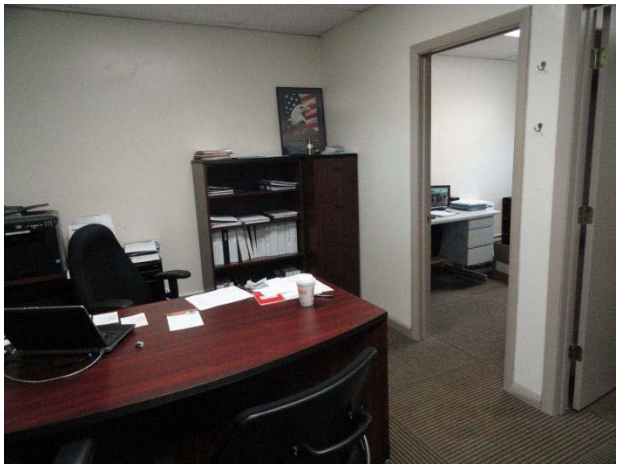
Rockville, CT Readiness Center



Break Room and Former Firing Range



Office

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Appendix D
IAQ and Lighting Survey Log Sheets

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	Rockville	IAQ								Light		
Date	8/21/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296						Serial Number		3021
Weather Conditions				Last Calibration		Mar-12						Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Old Kitchen		2	13:45	81.1	X	44.7		403		0.0		55-144		50
Men's Bathroom		3	13:50	79.8		46.2		417		0.2		25-162		5
Storage Room		3	13:51	78.4		54.4		524		0.1		13-70	X	30
Janitor's closet		2	13:52	79.8		50.4		513		0.0		40-50		30
Female latrine		2	13:53	79.1		51.6		523		0.1		25-150		5
Family Assistance Coordination		3	13:54	78.8		52.9		444		0.1		73-109		30-50
Band Room		3	13:55	78.3		49.7		373		0.0		90-175		30-50
Boiler Room		3	14:05	78.9		50.1		377		0.0		17-40	X	30
Drill Hall		6	14:06	80.1	X	48.0		382		0.0		50-94		50
Supply Room		4	14:06	81.0	X	52.9		405		0.0		61-150		30
Library		2	14:07	81.1	X	50.9		439		0.1		23-103	X	30-50
Mobile Rehearsal Pod		3	14:08	81.2	X	46.2		426		0.0		100-157		30-50
Break Room		2	14:08	80.6	X	47.3		429		0.1		20155		10
Locker Room		2	14:35	80.0		47.6		439		0.0		30-79		7
Men's Locker Room		3	14:37	79.4		49.0		424		0.0		15-96		7
R&R Office		3	14:28	79.2		43.0		729		0.0		48-165		30-50
Orderly Office		5	14:39	76.9		43.0		693		0.0		60-100		30-50
Recruiting Office		3	14:37	76.4		55.3		526		0.0		70-150		30-50
Outside			14:43	80.5		40.8		382		0.1				

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, Connecticut 03079

INDUSTRIAL HYGIENE SURVEY REPORT
SOUTHINGTON ARMORY
SOUTHINGTON, CONNECTICUT

September 2006
PN: 39741509

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 789 of 1092

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TABLE OF CONTENTS

Section **Page**

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 790 of 1092

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TABLE OF CONTENTS (Cont)

APPENDICES

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 791 of 1092

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate.	Increase illumination through use of task lighting. (ANSI / IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in wipe samples in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 3

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 792 of 1092

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Southington Armory located at 690 Woodruff Street in Southington, Connecticut 06489. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On September 10, 2005, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Southington, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Mr. Non-Responsive site contact for this survey.

This armory is a single-story brick and block building, with an attached drill hall that is constructed primarily of brick and mortar. This facility is built on a concrete slab, with a pitched asphalt roof. The building was constructed in 1971. A drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 793 of 1092

BEST AVAILABLE COPY

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. This is particularly true for part time employees. If more than one person is using that station, then proper adjustments need to be made to accommodate each person.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in room 25, classroom #2, Orderly Room, first Sergeant's office and outside. These readings were all measured using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 45.4-56.7% throughout the various building areas with an average of 52.2%. The average reading was below the recommended maximum level of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from 418 to 581 parts per million (ppm), with an average of 469.25 ppm. The outside reading was 425 ppm.

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 794 of 1092

motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 425 ppm on the day of the survey, the ASHRAE limit would be 1,125 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations remained at 1 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 795 of 1092

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (foot candles)	Recommended Lighting (foot candles)
Room 25	Office	28	50
Classroom #1	Classroom	27	50
Orderly Room	Office	40	50
Commander's Office	Office	69	50
1st Sergeants Office	Office	10	50

2.2.5 Lead

Wipe testing for lead was conducted in the administrative area using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 2-2 below shows the results of the lead sampling.

Table 2-2
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Storage Room – Top of Water Heater	0901-17	0.108	240	200
Locker Room Center – Top of Locker	0901-18	0.108	80	200
Classroom #1 – Top of Heater	0901-19	0.108	52	200
Blank	0901-20	N/A	0.64 µg	N/A

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 796 of 1092

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2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate generally throughout the facility. URS recommends increasing the area lighting or supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: A wipe sample collected for lead from the top of the water heater in the storage room was found to be above allowable limits and require cleaning. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. This area should be cleaned by personnel trained in accordance with the OSHA lead standard (29 CFR 1910.1025 and 1926.62).

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 797 of 1092

3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead dust was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Indoor Firing Range

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Firing End – Floor	0901-10	0.108	190	200
Center Floor	0901-11	0.108	190	200
Bullet Trap	0901-12	0.108	1300	200
Bullet Trap	0901-13	0.108	760	200
Room 25 (Firing Range Build –out)	0901-14	0.108	49	200
Blank	0901-04	N/A	0.49 µg	N/A

Sample numbers and locations can be found on the site map in Appendix A.

One air sample for lead dust was collected in Former Indoor Firing Range. Table 3-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 798 of 1092

Table 3-2
Airborne Concentration of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Permissible Exposure Limit ($\mu g/m^3$)
Former Firing Range Center	0915-01	420	<7.1	50.0
Blank	0915-03	N/A	<3 μg	N/A

Sample number and location can be found on the site map in appendix A.

On the day of the survey, the airborne lead dust level in the drill hall and mess hall was found to be below the OSHA permissible exposure limit of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Wipe samples collected from the former indoor firing range for lead were found to be above allowable limits and require cleaning. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Guidelines for the cleanup and rehabilitation of indoor firing ranges is included in Appendix H.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 799 of 1092

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a concrete floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall Floor – Outside Retention	0901-05	0.108	12	200
Drill Hall Floor Outside Kitchen	0901-06	0.108	9.2	200
Drill Hall Floor - Center	0901-07	0.108	13	200
Drill Hall – Locker Top	0901-08	0.108	17	200
Drill Hal Floor Outside Garage	0901-09	0.108	20	200
Blank	0901-04	N/A	0.49 µg	N/A

Sample numbers and locations can be found on the site map in Appendix A.

One air sample for lead dust was collected in Former Indoor Firing Range. Table 4-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 800 of 1092

Table 4-2
Airborne Concentration of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Permissible Exposure Limit ($\mu g/m^3$)
Drill Hall	0915-02	420	<7.1	50.0
Blank	0915-03	N/A	<3 μg	N/A

Sample number and location can be found on the site map in appendix A.

On the day of the survey, the airborne lead dust level in the drill hall and mess hall was found to be below the OSHA permissible exposure limit of 50.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be below allowable limits and require no cleaning or further testing. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 801 of 1092

5.0 BOILER ROOM AND GARAGE

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping. The garage is used for vehicle storage as well as containing the flammable materials storage locker.

5.2 Chemical and Physical Agents Sampled

5.2.1 Lead

Wipe testing for lead was conducted in the boiler room and garage using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 5-1 below shows the results of the lead sampling.

Table 5-1
Levels of Lead Dust Found in the Boiler Room and Garage

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Boiler Room Center – Top of Boiler	0901-15	0.108	91	200
Garage – Top of Flammable Materials Storage Cabinet	0901-16	0.108	880	200
Blank	0901-20	N/A	0.64 µg	N/A

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 802 of 1092

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5.6 Interpretation of Results

LEAD: A wipe sample collected for lead from the flammable materials storage cabinet in the garage was found to be above allowable limits and require cleaning. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. This area should be cleaned by personnel trained in accordance with the OSHA lead standard (29 CFR 1910.1025 and 1926.62).

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 803 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was found regarding hazard communication. Training records maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 804 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 805 of 1092

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APPENDIX A

ARMORY DRAWING

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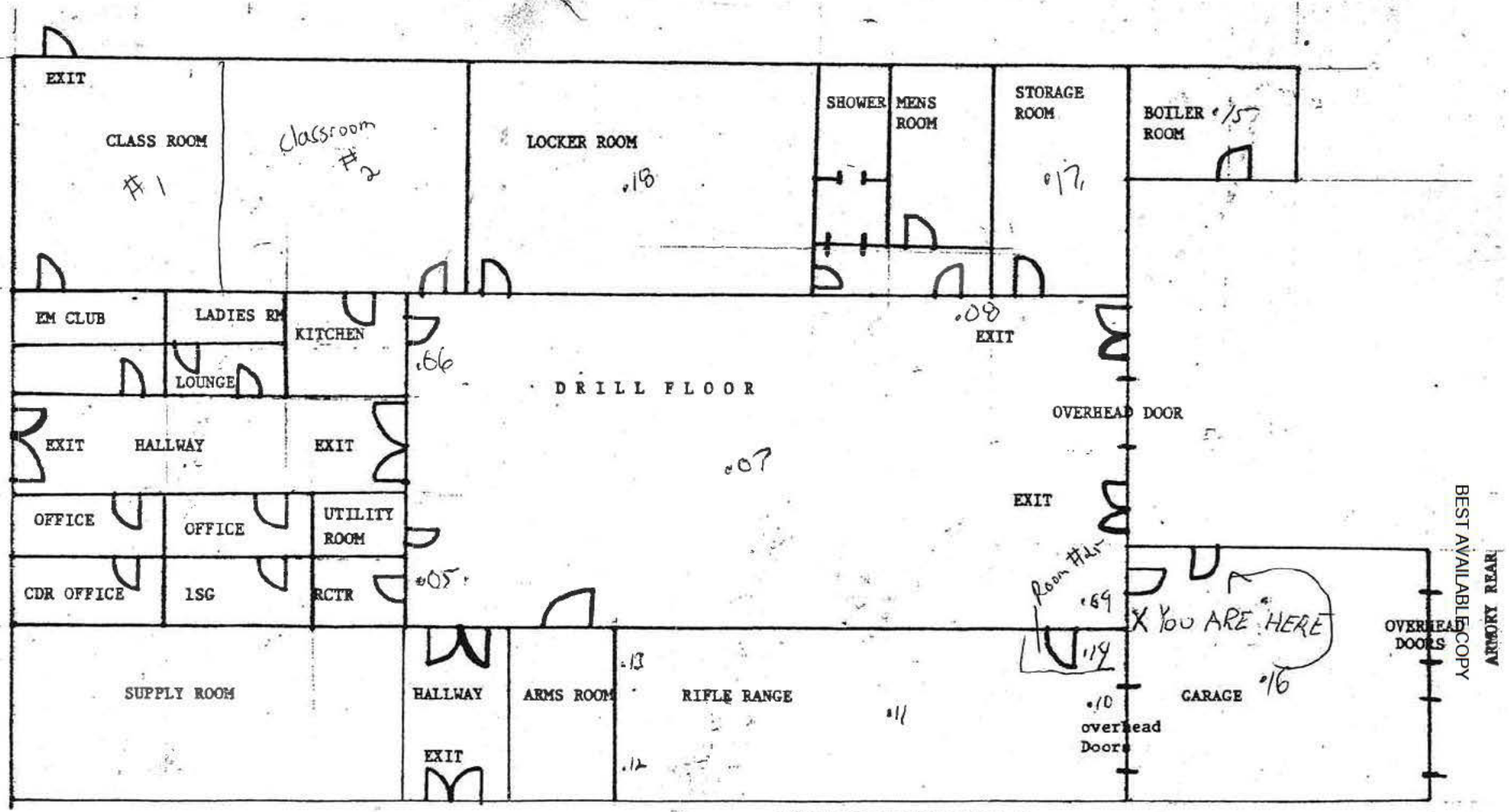

FIRE DEPT 628-5521
POLICE 621-0101
EMERGENCY BOMB THREAT 621-5522

FIRE BOX ALARM LOCATED AT DEPALO JR HS
PLEASANT ST

SOUTHINGTON ARMORY -SOUTHINGTON, CT

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 807 of 1092

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APPENDIX B

PERSONNEL LIST

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Not Provided

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APPENDIX C

HAZARDOUS MATERIALS LIST

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~~MAGAZINE~~
~~HAZARD~~

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HAZARDOUS MATERIAL INVENTORY LIST

DATE: ~~12-10-03~~ 12-10-04 (ML)

SOUTHINGTON ARMORY

Flammable Locker # 1

NSN	Nomenclature	Size	Quantity	MSDS #
Shelf 1	~~BATTERY~~			
	MinWax Polyurethane	1 QT	1	
	Zip strip paint Remover	1QT	1	
	Water level indicator	3 oz	2	
	So-Sure Spray can	1 pint	1	
	Dura flame Matches		1 Box	
	Honda spark Plugs		2	
Shelf 2	PAINT		9	
Medical info				
(514) 645-1300	Pitt-tech 90-453	1 GAL	1	
(514) 645-1300	Email interieur - latex	1 GAL	1	
(800) 278-6655	Premium Polyurethane	1 GAL	1	
(304) 843-1300	Email G-510 - latex	1 GAL		
1800-leAD-fyi	Benjamin Moore - latex O-B-309-3B	39.5 fl.oz	3	
	Rust-Oleum - Enamal	32 Fl.oz	2	
	fast-n EASY Ammonia	32 Fl.oz	10	
Shelf 3	~~PAINT~~		////	
	Peladow Calcium Chloride	Bags	5	

M.S.D.S located In Admin office

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 811 of 1092

~~ARMORY~~ Hazard

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HAZARDOUS MATERIAL INVENTORY LIST

DATE: ~~12-10-03~~ SOUTHINGTON ARMORY

Up-Dated 12-10-04 (ML)

Flammable Locker # 2

NSN	Nomenclature	Size	Quantity	MSDS #
Shelf 1	CRACK FYLEK	GL	4	
	OIL 2CYCLE	QT	1	
	OIL SAE 20	QT	4	
	OIL LOWTM	QT	1	
	OIL CORAL	QT	1	
	Gasoline	1GAL	1	
Shelf 2	GAS ONLINE AUTO	2-5gal	10	
	WEED KILLER		2	
	WEED WACKE gas	1	1	
(412) 434-3131	Spice Paint Hide latex 6-50	5-gal	2	
Shelf 3				

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Page 812 of 1092

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APPENDIX D

ANALYTICAL RESULTS

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NO. 707 002
AEROSOL MONITORING & ANALYSIS → 16038936240
09/30/2005 11:08 PAGE 14 of 002

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CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Armory-Drills Admin	**Chain Of Custody:**	144184		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Southington Armory	**Date Submitted:**	9/27/2005		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**			
		P.O. Number:	Not Provided	**Date Analyzed:**	9/30/2005	**Report Date:**	30-Sep-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0568458	0901-04	Furnace	Wipe Blank	****	N/A	0.30	ug	0.49	ug	
0568459	0901-05	Furnace	Wipe	****	0.108	2.79	ug/ft²	12	ug/ft²	
0568460	0901-06	Furnace	Wipe	****	0.108	2.79	ug/ft²	9.2	ug/ft²	
0568461	0901-07	Furnace	Wipe	****	0.108	2.79	ug/ft²	13	ug/ft²	
0568462	0901-08	Furnace	Wipe	****	0.108	2.79	ug/ft²	17	ug/ft²	
0568463	0901-09	Furnace	Wipe	****	0.108	2.79	ug/ft²	20	ug/ft²	
0568464	0901-10	Furnace	Wipe	****	0.108	69.70	ug/ft²	190	ug/ft²	
0568465	0901-11	Furnace	Wipe	****	0.108	69.70	ug/ft²	190	ug/ft²	
0568466	0901-12	Furnace	Wipe	****	0.108	139.41	ug/ft²	1300	ug/ft²	
0568467	0901-13	Flame	Wipe	****	0.108	111.52	ug/ft²	760	ug/ft²	
0568468	0901-14	Furnace	Wipe	****	0.108	13.94	ug/ft²	49	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive **Technical Manager:** [redacted]

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NO.633 008

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NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	144183
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Southington Armory 690 Woodruff St.	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	3974150900401	**Date Analyzed:**	9/28/2005

Report Date: 28-Sep-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0568362	090101	Flame	Air	420	N/A	7.14	ug/m³	<	7.1	ug/m³	
0568363	090102	Flame	Air	420	N/A	7.14	ug/m³	<	7.1	ug/m³	
0568364	090103	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted]

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Page 815 of 1092
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NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Southington Armory	**Chain Of Custody:**	145336
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Armory-Assembly	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	11/9/2005 **Report Date:** 09-Nov-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0604410	0901-15	Furnace	Wipe	****	0.108	69.70	ug/ft^2	91	ug/ft^2	
0604411	0901-16	Furnace	Wipe	****	0.108	139.41	ug/ft^2	880	ug/ft^2	
0604412	0901-17	Furnace	Wipe	****	0.108	69.70	ug/ft^2	240	ug/ft^2	
0604413	0901-18	Furnace	Wipe	****	0.108	69.70	ug/ft^2	80	ug/ft^2	
0604414	0901-19	Furnace	Wipe	****	0.108	13.94	ug/ft^2	52	ug/ft^2	
0604415	0901-20	Furnace	Wipe Blank	****	N/A	0.30	ug	0.64	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] **Technical Manager:** [redacted]

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APPENDIX E

TRAINING CERTIFICATES

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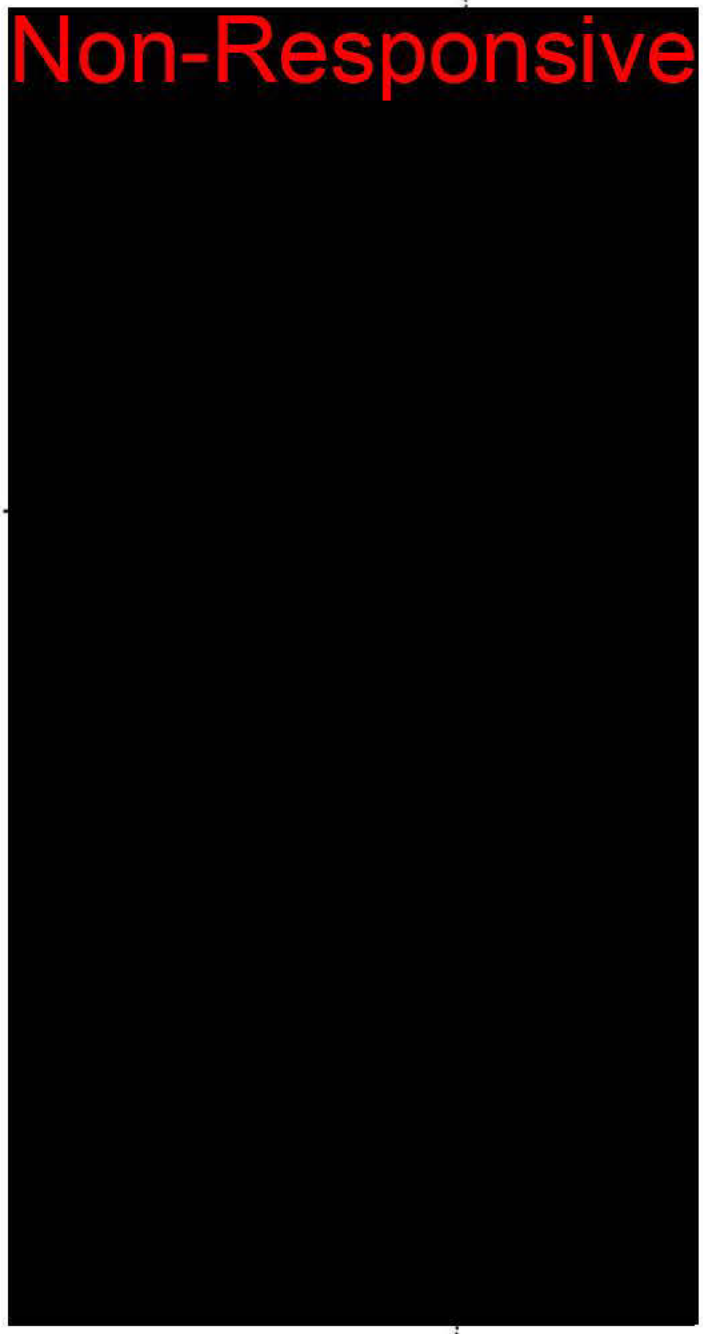

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INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted]

has completed the requisite training, and has passed an examination for reaccreditation

Asbestos Project Monitor Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

For course participants seeking New York State certification or New York State training reciprocity, the official record of successful completion is the DOH 2832 Certificate of Completion of Asbestos Safety Training

February 16, 2005
Course Dates

February 16, 2005
Examination Date

February 16, 2006
Expiration Date

05739517413670
Certificate Number

[redacted]
President/Director of Training

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FOIA Requested Record #J-15-0085 (CT)
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Page 819 of 1092

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APPENDIX F

PHOTOGRAPHS

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Photo 6982: Former Indoor Firing Range – Firing End

Photo 6983: Former Indoor Firing Range – Bullet Trap

Photo 6984: Drill Hall

Photo 6985: Drill Hall

Photo 6986: Boiler Room

Photo 6987: Classroom #1

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Photo 6988: Kitchen

Photo 6989: Commander's Office

Photo 6990: Room 205 – Water Damage

Photo 6991: Exterior View

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building,

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15 30 DECEMBER 2002)

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

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FOIA Requested Record #J-15-0085 (CT)
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Page 827 of 1092

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3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre molstened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman #41 or #40 paper

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FOIA Requested Record #J-15-0085 (CT)
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Page 828 of 1092

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(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 829 of 1092

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b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Ealing and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 830 of 1092

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g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:
(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 831 of 1092

BEST AVAILABLE COPY

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 832 of 1092

BEST AVAILABLE COPY

APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 833 of 1092

BEST AVAILABLE COPY

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

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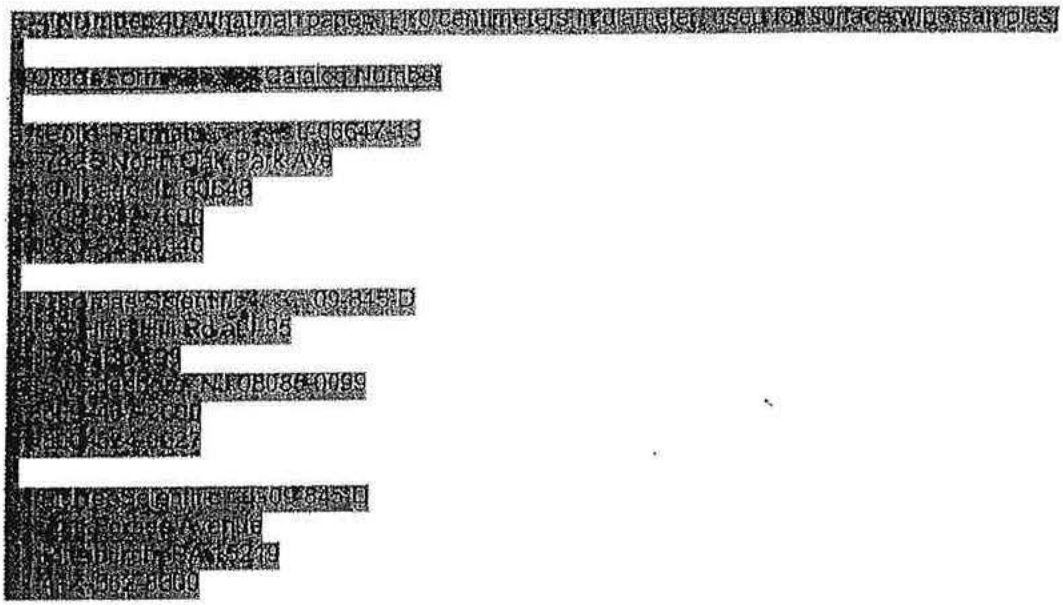
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 834 of 1092

BEST AVAILABLE COPY

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472



E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From	Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 835 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 836 of 1092

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APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet

Return Address		Point of Contact *(name & phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			

Sampling Data

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 837 of 1092

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APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			
Sampling Data			

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer

Comments to Lab:

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 838 of 1092

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APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 839 of 1092

BEST AVAILABLE COPY

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 840 of 1092

BEST AVAILABLE COPY

Industrial Hygiene Survey

Connecticut Army National Guard (CT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Southington Readiness Center
690 Woodruff Street
Southington, CT 06489

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: August 21, 2012

AEI Project #: J12-676 3h CT Southington RC

_____

Non-Responsive, **CIH, CSP, LEED Green Associate**
Industrial Hygienist

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 841 of 1092

Table of Contents

List of Tables and Appendices

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 842 of 1092

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CT ARNG) Southington Readiness Center located at 690 Woodruff Street, Southington, CT 06489. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 21, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed in the building. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. No damaged suspect material was observed.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good. All areas were clean and tidy.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in one area (the Supply Room) because a bulb was out. The illumination measurements indoors ranged from 20 foot candles (fc) to over 1,000 fc.

Indoor Air Quality: Temperature measurements were mostly below the comfort ranges for the summer season, and relative humidity measurements were within the comfort ranges on the day of the survey. The outdoor temperature and relative humidity were 80.5° F and 40.8% on the day of monitoring, and there were no complaints from employees about the cooler temperatures. The facility has central air-conditioning. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide were below the recommended concentrations in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available; however, MSDSs were readily available and up to date as required by the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program and any related training records be placed in every MSDS notebook.

Noise: No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 843 of 1092

occur at the RC except for regular testing of the large generator stored outside and intended to run the RC in the event of a power outage. The generator is tested weekly for 15 minutes by the maintainer. The maintainer reports that he wears hearing protection while testing the generator. The generator could not be tested on the day of the survey due to a ban on running generators related to ozone restrictions. A written hearing conservation program was not available for review per the OSHA standard 29 CFR 1910.95 Occupational Noise Exposure. It is recommended that the written program and any related training records be included in the same notebook with the hazard communication program and MSDSs.

Overall, the Southington Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 844 of 1092

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CT ARNG) Southington Readiness Center located at 690 Woodruff Street, Southington, CT 06489. Non-Responsive CIH, CSP, LEED Green Associate performed the evaluation on August 21, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive . The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Southington Readiness Center was built in the 1970's and was recently renovated. The readiness center is staffed by 3 National Guard administrative personnel and 1 civilian caretaker (maintainer). The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Southington Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Southington facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state employed maintainer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC except for regular testing of the large generator stored outside and intended to run the RC in the event of a power outage. The generator is tested weekly for 15 minutes by the maintainer. The maintainer reports that he wears hearing protection while testing the generator. The generator could not be tested on the day of the survey due to a ban on running generators related to ozone restrictions. A written hearing conservation program was not available for

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 845 of 1092

review per the OSHA standard 29 CFR 1910.95 Occupational Noise Exposure. It is recommended that the written program be included in the same notebook with the hazard communication program and MSDSs.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for damaged building materials that may contain asbestos or lead-based paint, for water damage or mold problems; for potential ergonomic problems; and for housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the state of Connecticut limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical Services, Inc. (AMA) of Lanham, MD for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum level for surface contamination. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for CTARNG Southington Readiness Center on August 21, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
SRC-W01	Drill Hall – floor	<110
SRC-W02	Drill Hall – floor near arms vault	<110
SRC-W03	Drill Hall – floor near bay door	<110
SRC-W04	Drill Hall – floor under basketball hoop	<110
SRC-W05	Drill Hall – return grill vent	<110
SRC-W06	Locker room – floor (former firing range)	<110
SRC-W07	Locker room – top of locker (former firing range)	<110

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 846 of 1092

Table 1 – Results of Dust Wipe Sampling for CTARNG Southington Readiness Center on August 21, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft²)*
SRC-W08	Serving counter to kitchen	<110
SRC-W09	Kitchen – prep table	<110
SRC-W10	Break room – counter near coffee pot	<110
SRC-W11	Fitness Center – center of rubber floor mat	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged suspect ACM was observed.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good. Most areas were clean and tidy.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in one area (the supply room because a bulb was out). The illumination measurements indoors ranged from 20 foot candles (fc) to over 1,000 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 847 of 1092

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 69.7 to 74.5° F and 45.1 to 51.4% Rh. Temperatures were mostly lower than the summer comfort ranges, and relative humidity measurements were within the comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 80.5° F and 40.8%, and no employees complained about the cooler temperatures. The readiness center has central air-conditioning.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 418 to 540 parts per million (ppm). The outdoor CO_2 concentration was 382 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.1 to 0.5 ppm; therefore all measurements were below the concentrations of concern.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program and any related training records be placed in every MSDS notebook.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 848 of 1092

7 Conclusions

The results of the evaluation indicated a few minor concerns at the facility. Overall, the Southington Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 849 of 1092

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11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 850 of 1092

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Appendix A
Building Layout

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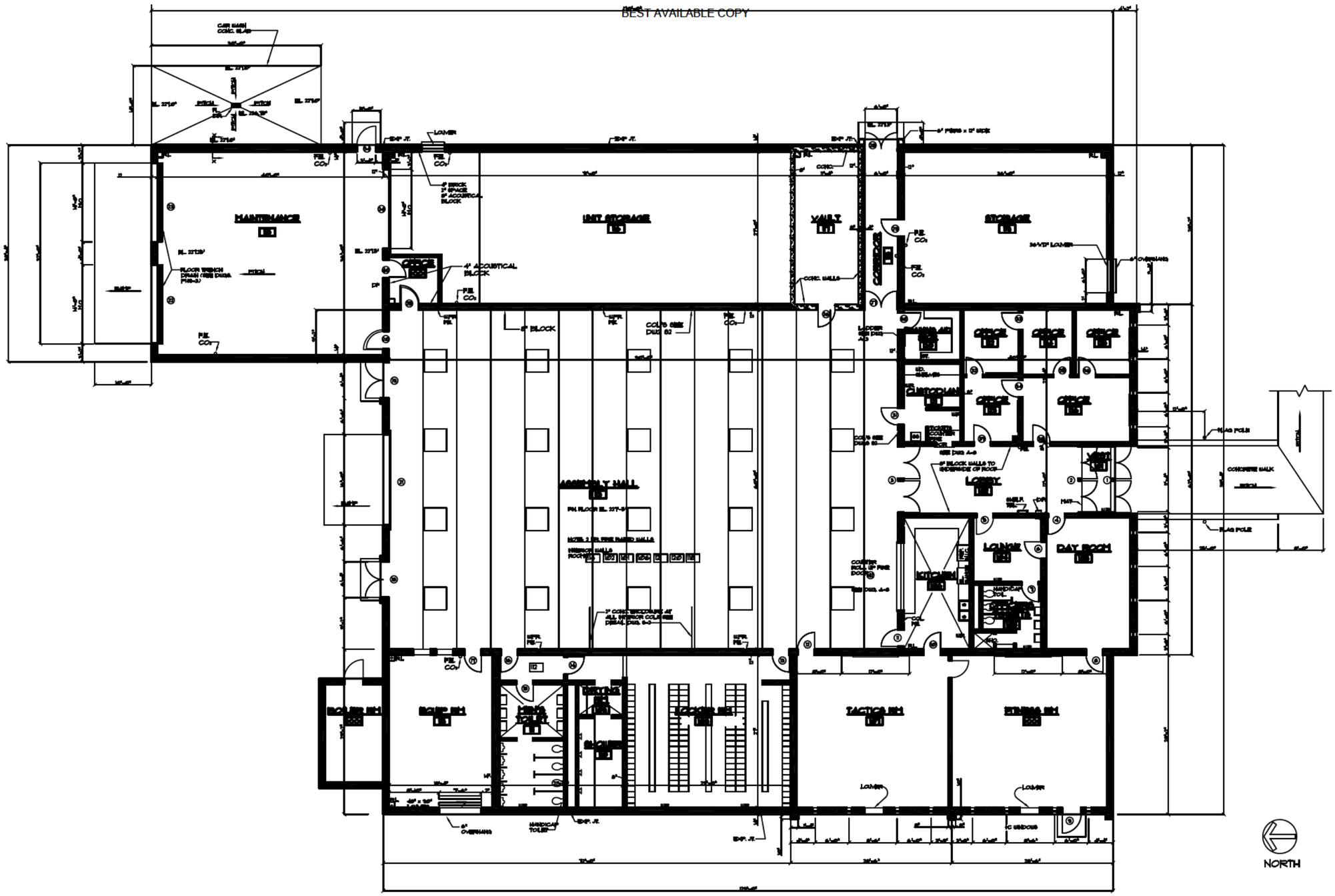

FLOOR PLAN

DRAWN BY: XX

EXISTING FIRST FLOOR PLAN

28 MAR 2006

SO - SOUTHINGTON ARMORY
CONNECTICUT ARMY NATIONAL GUARD

SOUTHINGTON, CONNECTICUT

STATE OF CONNECTICUT
MILITARY DEPARTMENT
Facilities Management Office

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Appendix B
Certificates of Analysis

FOIA Requested Record #J-15-0085 (CT)
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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Southington RC	**Chain Of Custody:**	513795
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Southington, CT	**Date Submitted:**	8/30/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/5/2012
Attention:	Non-Responsive				**Report Date:** 9/5/2012

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
12089775	SRC- W 01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089776	SRC- W 02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089777	SRC- W 03	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089778	SRC- W 04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089779	SRC- W 05	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089780	SRC- W 06	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089781	SRC- W 07	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089782	SRC- W 08	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089783	SRC- W 09	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089784	SRC- W 10	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12089785	SRC- W 11	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Southington RC	**Chain Of Custody:**	513795		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Southington, CT	**Date Submitted:**	8/30/2012		
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/5/2012	**Report Date:**	9/5/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Ana Non-Responsive

Technical Manager: Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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OWI (410) 247-2024

Southington RC
CTARNG

159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 513795

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: Southington RC
2. Job Location: Southington, CT
3. Job #: 312-676 P.O. #: W912K6-09-A-0003
4. Contact Person: [redacted]
5. Submitted by: [redacted] Signature: [redacted]

Reporting Information (Results will be provided [redacted]):

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☒ 5 Day + Date Due: 9/7/12
☐ 2 Day
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Inc[redacted] ith Report
☐ Fax
☐ Ve[redacted]
[redacted] us.army.mil
[redacted] us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)

PLM Bulk
☐ EPA 600 – Visual Estimate (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)

MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)

TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area) Dust D6480-99 (QTY)

TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted.
(TEM Water samples ___ ___ °C)

Metals Analysis
☐ Pb Paint Chip (QTY)
☒ Pb Dust Wipe (wipe type 10x10cm) 11 (QTY)
☐ Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media:
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WATER AND OTHER	MATRIX: SPORE TRAP	MATRIX: TAPE	MATRIX: SWAB

See Attached Sheets

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 8 / 30 / 12 @ 1030 Via: FEDEX By (Print): [redacted]
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / / Initials:
4. Comments: 7987 2721 9810

[redacted]

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Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 8/21/12

Job Site: Southington

Project No.: J12-67e

Inspector: Non-Responsive

Sample No.	Sample Type	Sample Location	Dimensions (Area)
SRC-W01	lead	drill hall (Corner dusty) near office	10cm x 10cm
SRC-W02		drill hall near Arms Vault	
SRC-W03		drill hall near bay door	
SRC-W04		drill hall under basketball hoop	
SRC-W05		drill hall refrigerator	
SRC-W06		locker room floor ceramic former IFR	
SRC-W07		locker room top of locker former IFR	
SRC-W08		sewing center in kitchen to hall	
SRC-W09		kitchen prep table	
SRC-W10		break room counter near coffee	
SRC-W11		fitness center (Rubber floors) center	

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Appendix C
Photo Documentation

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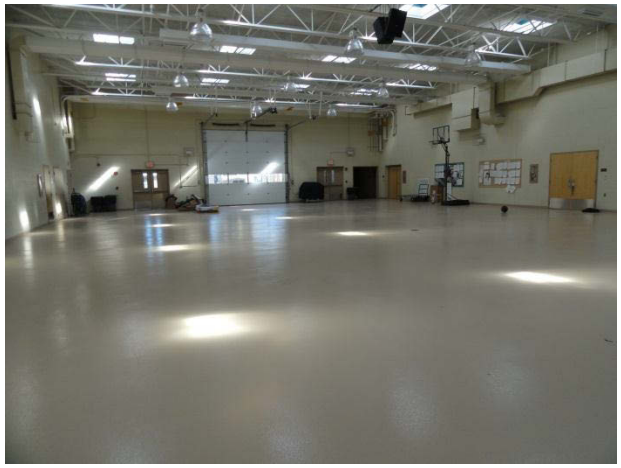
Southington, CT Readiness Center



Drill Hall

Drill Hall

Kitchen

Fitness Center

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Southington, CT Readiness Center

Break Room

Supply Room

Boiler Room

Maintainer's Office

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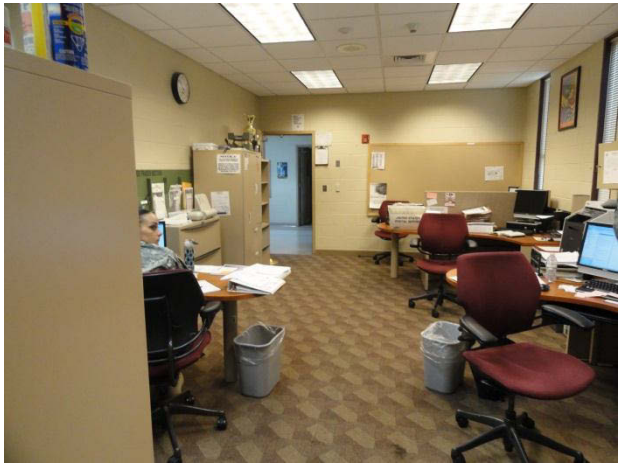
Southington, CT Readiness Center

Classroom

Conference Room



Office

Front Lobby

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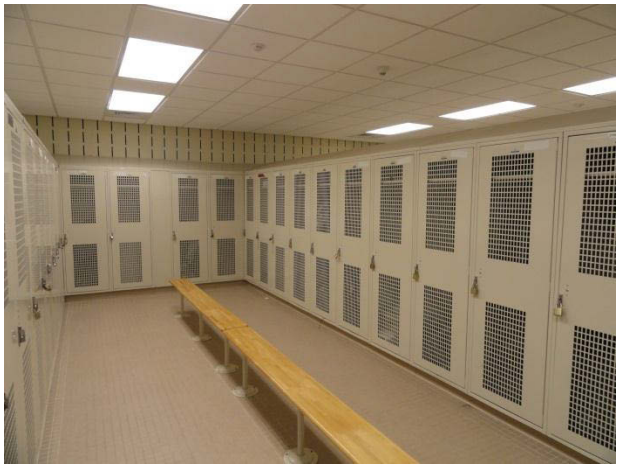
Southington, CT Readiness Center

Electrical Closet



Locker Room - Former Firing Range

Electrical Room and Storage Area

Generator and Fuel Tank

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Southington, CT Readiness Center

Custodian's Closet

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Appendix D
IAQ and Lighting Survey Log Sheets

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	Southington	IAQ							Light		
Date	8/21/2012	Inspecto	Non-Responsive [redacted]	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296					Serial Number		3021
Weather Conditions				Last Calibration		Mar-12					Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Classroom		3	11:31	70.4	X	50.5		524		0.2		85-125		30-50
Drill Hall		1	11:33	74.5		50.5		418		0.5		59-1,000		50
Break Room		1	11:34	71.6	X	45.1		491		0.3		40-120		10
Fitness Center		1	11:36	70.9	X	45.7		476		0.5		50-100		30
Kitchen		1	11:38	71.2	X	46.5		465		0.2		50-83		30
Supply		2	11:41	72.0	X	48.2		484		0.4		20-40	X	30
Locker Room		1	11:43	72.1	X	47.9		429		0.1		40-70		7
Platoon Office		1	11:44	71.5	X	47.9		445		0.3		30-140		30-50
Lobby from Parking lot		1	11:45	72.3		51.4		435		0.1		40-60		10
Main Foyer		1	11:45									30-130		10
Readiness Office		1	11:46	72.2	X	48.9		540		0.2		30-90		30-50
Orderly Room		4	11:47	71.6	X	49.5		517		0.3		90-125		30-50
Library		1	11:47	69.7	X	47.0		495		0.5		60-95		30-50
Women's Bathroom		1	11:48	70.6	X	50.1		443		0.1		48-200		5
Maintainer's Office		1	11:48	72.5		49.4		521		0.1		40-52		30-50
Outside			14:43	80.5		40.8		382		0.1				

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, Connecticut 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
STRATFORD ARMORY
STRATFORD, CONNECTICUT

March 2006
PN: 39741509

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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FOIA Requested Record #J-15-0085 (CT)
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Page 866 of 1092

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TABLE OF CONTENTS

Section **Page**

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TABLE OF CONTENTS (Cont)

APPENDICES

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 868 of 1092

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Lighting		
On the day of the survey, the illumination throughout was mostly adequate.	Increase lighting through use of task lighting where lighting intensities are below recommended minimum lighting intensities (ANSI/IESNA RP-1-04)	RAC 4
Lead		
Lead was detected in wipe samples collected from the former indoor firing range exceeded 200μg/ft^2	Personnel trained in accordance with the OSHA Lead Standard should clean the former indoor firing range.(OSHA 29 CFR 1910.1025 (e)(1)(i))	RAC 4
Ergonomics		
Computer workstations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (Department of the Army Pamphlet 40-21, Chapter 4, Page 7, Section 4-3)	RAC 3
Hazard Communication		
A site specific hazard communication plan available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Mold		
Water damaged was observed throughout. Mold growth could become an issue if left unattended.	Determine and repair source of water. Replace water damaged building materials and implement a moisture management program to provide direction for future water incursions (Best management practice)	RAC 4
Walking-Working Surfaces		
The exterior entry stair is in a deteriorated condition and in need of repair.	Repair entry stairs (OSHA General Duty)	RAC 3

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 869 of 1092

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office , URS Corporation (URS) conducted an industrial hygiene survey at the Stratford Armory located at 63 Armory Road in Stratford, Connecticut 06614. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On August 26, 2005, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Stratford, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Mr. Non-Responsive site contact for this survey.

This armory is a single-story brick and block building, with an attached drill hall, that is constructed primarily of brick and mortar. This facility is built on a concrete slab with a flat roof. Interior finishes include floor tile, suspended ceilings and drywall. The building was constructed in 1962. A layout drawing of the facility, which shows the sample locations is attached in Appendix A. The main entrance stairway is in disrepair and poses a significant tripping hazard.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 870 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning workstations at the time of this survey.

Water damage was observed throughout this area.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the drill hall, mess hall, boiler room, storage room and outside. These readings were all measured using a TSI Q-Trak ^{TM} (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 51.8-56.4% throughout the various building areas with an average of 53.75%. The average reading was below the recommended maximum of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from a low of 411 to a spike of 500 parts per million (ppm), with an average of 447.75 ppm. The outside reading was 400 ppm.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 871 of 1092

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 400 ppm on the day of the survey, the ASHRAE limit would be 1,100 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 0 to 1 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 872 of 1092

recommended lighting requirement (ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting lux / foot candles	Recommended Lighting lux / foot candles
Room 7-A (PSNCO)	Administration	686 / 63.8	500 / 50
Room 7-A (Fax machine)	Administration	534 / 49.6	500 / 50
Room 48 (Recruiting)	Administrative	256 / 24	500 / 50
Room 8 (Training/ OPS)	Administrative	719 / 66.8	500 / 50
Room 8 (Orderly)	Administrative	618 / 57.5	500 / 50
Room 2 (Recruiting)	Administrative	712 / 66.1	500 / 50
Room 2 (Recruiting)	Administrative	958 / 87.7	500 / 50

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors should be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in room 48, recruiting. URS recommends increasing the area lighting or

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 873 of 1092

supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

MOLD: Water damage was observed throughout the administrative area. If left unchecked mold could become a significant problem.

HAZARD COMMUNICATION: Listed containers of paints and thinners were observed in the flammable locker with MSDS forms.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 874 of 1092

3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now primarily used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Top of Flammable Locker	0826-10	100 cm^2	1600	200
Top of Stairs	0826-11	100 cm^2	57	200
Floor Center	0826-12	100 cm^2	280	200
At Wood Wall	0826-13	100 cm^2	140	200
At Wood Wall	0826-14	100 cm^2	180	200
Blank	0826-04	N/A	<0.3	200

Sample numbers and locations can be found on the site map in Appendix A.

One air sample for lead dust was collected in the Former Firing Range. Table 3-2 below shows the result of these air samples.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 875 of 1092

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Table 3-2
Airborne Concentration of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	Lead Action Level ($\mu g/m^3$)
Former Firing Range Center	0826-03	281.25	<11	30.0
Blank	0826-01	N/A	<3µg	N/A

Sample number and location can be found on the site map in appendix A.

On the day of the survey, the airborne lead dust level in the former firing range was found to be below the OSHA action level of 30.0 $\mu g/m^3$ averaged over an 8-hour day.

3.2.2 Asbestos

Bulk samples were collected from damaged suspect asbestos-containing materials (ACM) by Mr. Eric Frederick for a determination of asbestos content. Materials sampled included ceiling/wall tiles and associated glue daubs. Results indicated these samples did not contain asbestos and are provided in Table 3-3. Analytical procedures were performed in accordance with the U.S. Environmental Protection Agency (EPA) Recommended Method for the Determination of Asbestos in Bulk Samples by Polarized Light Microscopy and Dispersion Staining (PLM/DS)(EPA-600/M4-82-020. EPA-600/R-93-116

Table 3-3
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Former Firing Range	12" x 12" Ceiling / Wall Tile	0826-26A	NAD
Former Firing Range	12" x 12" Ceiling / Wall Tile	0826-26B	NAD
Former Firing Range	Brown Glue Daub	0826-27A	NAD
Former Firing Range	Brown Glue Daub	0826-27B	NAD

The U. S. Environmental Protection Agency (EPA) states that any material with greater than 1% asbestos must be treated as ACM (U.S. EPA, Title 40 CFR Part 763.87 (c)(2)).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 876 of 1092

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3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Lead wipe samples indicated levels of lead dust to be above the 200 µg/square foot limit set by the National Guard Bureau Region North IH Office (See Appendix G). Guidance for cleaning former indoor firing ranges is provided in Appendix H.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 877 of 1092

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4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a hard wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Top of Electrical Box	0826-05	10x10 cm	84	200
Outside Vehicle maintenance- floor	0826-06	10x10 cm	11	200
Drill Hall Center- Floor	0826-07	10x10 cm	26	200
On Kitchenette Counter	0826-08	10x10 cm	11	200
Floor- Outside Main Hall	0826-09	10x10 cm	79	200
Blank	0826-04	N/A	<0.3	200

Sample numbers and locations can be found on the site map in Appendix A.

One air sample for lead dust was collected in the Drill Hall. Table 4-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 878 of 1092

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Table 4-2
Airborne Concentration of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	Lead Action Level ($\mu g/m^3$)
Drill Hall Center	0826-02	150	<20	30.0
Blank	0826-01	N/A	<3	N/A

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be below allowable limits and require no cleaning at this time. The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 879 of 1092

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5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

No Chemical or physical Agents were sampled in this area.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

No environmental health and safety issues were observed in the boiler room.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 880 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A program was found regarding hazard communication. Training records maintained at the Connecticut AASF. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 881 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 882 of 1092

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APPENDIX A

ARMORY DRAWING

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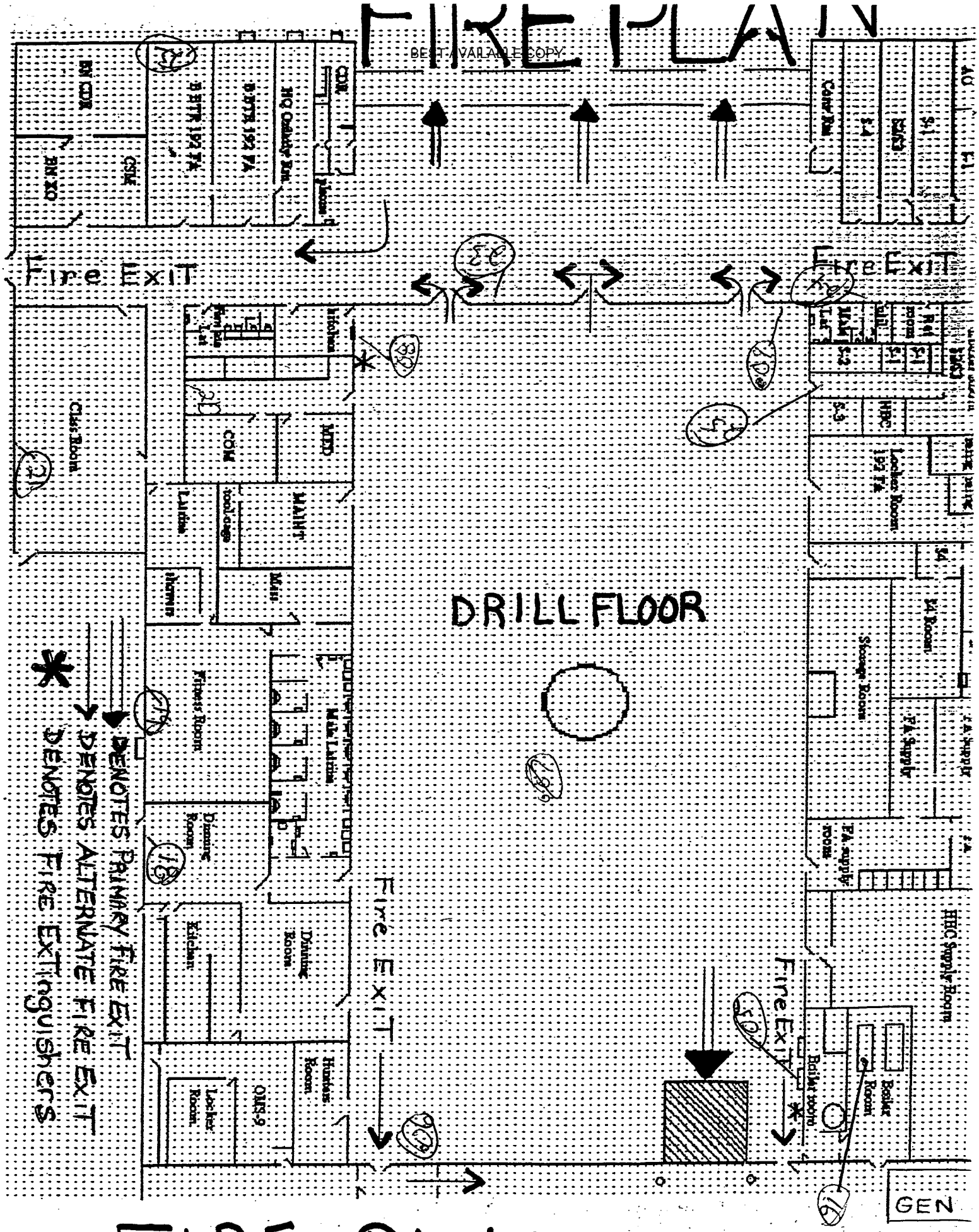

FIRE PLAN

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APPENDIX B

PERSONNEL LIST

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Not Provided

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APPENDIX C

HAZARDOUS MATERIALS LIST

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Cabinet #2

HAZARDOUS MATERIAL INVENTORY LIST

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23 Feb 02

NSN	Nomenclature	Size	QTY	Manufacturer	MSDS#
Shelf 1					
6840-01-278-1336	Perm Anthropod Repellent	BX	12	Coulston International Corp.	193
6840-01-278-1336	Perm Anthropod Repellent	CN	16	Coulston International Corp.	196
~~6260-01-086-8077~~	~~Cyalume PML~~	~~BX~~	~~1~~	~~American Cyanamid Corp~~	~~670~~
6840-00-823-7849	Insecticide Aerosol Type 2 Size 1	CN	15	Airsol Company, Inc	196
~~6840-01-067-6674~~	~~Insecticide Aerosol D-phenuthrin~~	~~CN~~	~~0~~	~~Airsol Company, Inc~~	
Shelf 2					
6480-01-284-3982	Insect Repellent Personal App.	CS	3	Minnesota Mining and Mfg. Co	192
6480-01-284-3982	Insect Repellent Personal App.	BX	24	Minnesota Mining and Mfg. Co	192
6480-01-137-8456	Chigger Repellent/Antipruritic	CS	2	Pierson Labratories, Inc	190
~~6840-00-753-4963~~	~~Insect Repellent~~	~~EA~~	~~0~~	~~Airsol Company, Inc~~	~~191~~
Shelf 3	TOP of CABINET # 3				
8970-01-321-9153	Ration Suppl Flameless Heater	CS	9	Truetech Inc.	T/I

FOIA Requested Record #J-15-0085 (CT)
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Cabinet #3

HAZARDOUS MATERIAL INVENTORY LIST

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23 FEB 02

NSN	Nomenclature	Size	QTY	Manufacturer	MSDS#
Shelf 1					
7390-00-459-2247	Oven Cleaner	8oz CN	12	Dihoma Chemical and Mfg, Inc	107
8010-00-152-3245	Lin Seedoil	1GL CN	1	CSD Inc.	283
8030-00-664-4944	Preservative Coating Canvas	1GL CN	1	Midland Chemical Corp	
8010-00-664-0019	Coating Kit	1QT CN	8	Chemical Commodities	286
~~8010-00-582-5382~~	~~Laquer Flat Black~~	~~1oz CN~~	~~0~~	~~LHB Industries, Inc.~~	~~460~~
~~8010-00-584-3148~~	~~Laquer Orange~~	~~10oz CN~~	~~1~~	~~LHB Industries, Inc.~~	~~464~~
8010-00-721-9747	Laquer Blue	10oz CN	1	LHB Industries, Inc.	468
~~8010-00-598-5936~~	~~Enamel Semi Gloss Olive Drab~~	~~10oz CN~~	~~0~~	~~LHB Industries, Inc.~~	~~466~~
8010-00-141-2958	Laquer Gray	10oz CN	1	LHB Industries, Inc.	458
~~8010-00-584-3149~~	~~Laquer Olive Green~~	~~10oz CN~~	~~1~~	~~LHB Industries, Inc.~~	~~465~~
8010-00-515-2487	Laquer Clear	10oz CN	1	LHB Industries, Inc.	463
~~8030-00-087-8630~~	~~Antisieze Compound~~	~~1LB CN~~	~~0~~	~~Makoor Products Mtg Co., Inc.~~	~~23~~
8010-01-229-7546	Coating Aliphate Poly	1QT CN	2	Hentzen Coating Inc.	344
~~8010-010229-7543~~	~~Coating Aliphate Poly~~	~~1QT CN~~	~~1~~	~~Hentzen Coating Inc.~~	~~345~~
8030-00-209-8005	Sealing Compound	8oz CN	4	Versatile Industries	140
~~8010-00-290-6984~~	~~LAQUER GLOSS BLACK~~	~~10oz CN~~	~~0~~	~~LHB IND, INC~~	~~461~~
8010-00-141-2950	LAQUER YELLOW	10oz CN	2	LHB IND, INC	467
Shelf 2					
~~6810-00-815-4727~~	~~Calaium Carbide~~	~~12LB CN~~	~~1~~	~~Manufacturing Chemists Assn.~~	~~T/I~~
6810-00-597-5280	Sodium Hexameta tech	12LB CN	2	Monsanto Company	T/I
~~6505-00-261-7256~~	~~Isopropyl Alcohol~~	~~1QT BT~~	~~1~~	~~Hydrax Laboratories~~	~~35~~
6810-00-123-7046	Banana Oil	7LB BT	2	Amco Chemical Corp	
7930-00-N06-8733	Mineral Oil	BT	1	ER Aquill and Sons, Inc.	282
7930-00-935-3794	Polish Plastic Type Liquid	1PT CN	1	Ain Plastic	360
7510-00-224-6234	Marking Stencil	1PT CN	2	Ideal Stencil Machine and Tape Co	
9150-00-117-8291	Lubricating Oil 2 Cycle Eng	1PT CN	1	Guardman Products Inc.	279
~~8010-00-290-6983~~	~~LAQUER GLOSS WHITE~~	~~10OZ CN~~	~~0~~	~~LHB IND, INC~~	~~459~~
~~8010-00-721-9747~~	~~LAQUER BLUE~~	~~10OZ CN~~	~~0~~	~~LHB IND, INC~~	~~468~~
7930-01-294-1115	SCOURING POWDER	CN	1	FITZPATRICK BROS INC.	409
~~7930-00-721-8572~~	~~SCOURING POWDER W/CHLOR BLEACH~~	~~CN~~	~~3~~	~~FINE ORGANIC CORP~~	~~403~~
~~5434~~	~~PARKER CAR~~ RED	CN	2		463
Shelf 3					
9110-00-263-9865	Fuel Tabs	BX	1	Van Ben Industries, Inc.	T/I
8040-00-291-8621	Adhesive	1LB CN	1	Bakers Sealant and Coatings, Inc	423
6830-00-584-3041	Propane Bottles	BT	15	Turner Company	36
6135-00-926-8322	Battery Dry (PRC-77)	CS	1	Rayovac Corp.	671

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 889 of 1092

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APPENDIX D

ANALYTICAL RESULTS

FOIA Requested Record #J-15-0085 (CT)
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09/30/2005 16:31 16038936240 AEROSOL MONITORING & ANALYSIS → PAGE 01

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Stratford Academy	**Chain Of Custody:**	144197
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Administration/Assembly	**Date Submitted:**	9/27/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	9/30/2005 **Report Date:** 30-Sep-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0568428	0626-04	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0568429	0626-05	Furnace	Wipe	****	0.108	69.70	ug/ft²	84	ug/ft²	
0568430	0626-06	Furnace	Wipe	****	0.108	2.79	ug/ft²	11	ug/ft²	
0568431	0626-07	Furnace	Wipe	****	0.108	2.79	ug/ft²	26	ug/ft²	
0568432	0626-08	Furnace	Wipe	****	0.108	2.79	ug/ft²	11	ug/ft²	
0568433	0626-09	Furnace	Wipe	****	0.108	69.70	ug/ft²	79	ug/ft²	
0568434	0626-10	Flame	Wipe	****	0.108	111.52	ug/ft²	1600	ug/ft²	
0568435	0626-11	Furnace	Wipe	****	0.108	13.94	ug/ft²	57	ug/ft²	
0568436	0626-12	Furnace	Wipe	****	0.108	69.70	ug/ft²	280	ug/ft²	
0568437	0626-13	Furnace	Wipe	****	0.108	69.70	ug/ft²	140	ug/ft²	
0568438	0626-14	Furnace	Wipe	****	0.108	69.70	ug/ft²	180	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Technical Manager: [redacted]

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	144198
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Stratford Armory, Armory Rd Stafford CT	**Date Analyzed:**	9/30/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	39741509.00401		

Attention: [redacted]

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments
0568337	0826 26A	NAD	–	–	–	–	20	–	20	–	–	60	Gray	Homogeneous	CK	
0568338	0826 26B	NAD	–	–	–	–	20	–	20	–	–	40	Gray	Homogeneous	CK	
0568339	0826 27A	NAD	–	–	–	–	–	–	2	–	–	98	Brown	Homogeneous	CK	
0568340	0826 27B	NAD	–	–	–	–	–	–	TR	–	–	100	Brown	Homogeneous	CK	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

[redacted]

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
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10/04/2005 12:01 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.763 001
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Page 892 of 1092

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	145333
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Stratford Armory-CT	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	10/24/2005

Report Date: 24-Oct-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0604420	0826-01	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	
0604421	0826-02	Flame	Air	150	N/A	20.00	ug/m³	<	20	ug/m³	
0604422	0826-03	Flame	Air	281	N/A	10.68	ug/m³	<	11	ug/m³	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted] Non-Responsive

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FOIA Requested Record #J-15-0085 (CT)
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Page 893 of 1092

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APPENDIX E

TRAINING CERTIFICATES

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Non-Responsive

[redacted]

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May-04-05 09:34am From-URS CORPORATION T-867 P.03/05 F-080
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INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive, Wilmington, MA 01887
(978) 658-5272

IEE IEE

This is to certify that

[redacted] Non-Responsive

has completed the requisite training, and has passed an examination for reaccreditation

Asbestos Project Monitor Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

For course participants seeking New York State certification or New York State training reciprocity, the official record of successful completion is the DOH 2832 Certificate of Completion of Asbestos Safety Training

February 16, 2005
Course Dates

February 16, 2005
Examination Date

February 16, 2006
Expiration Date

05739517413670
Certificate Number

[redacted] Non-Responsive
President/Director of Training

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 896 of 1092

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APPENDIX F

PHOTOGRAPHS

FOIA Requested Record #J-15-0085 (CT)
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Photo 1: Conference Room – Water damaged fiberglass pipe insulation

Photo 2: Conference Room – Water damaged ceiling tile

Photo 3: Hall outside drill hall – Wipe sample locations

Photo 6: Room 1A – Water damaged ceiling tiles

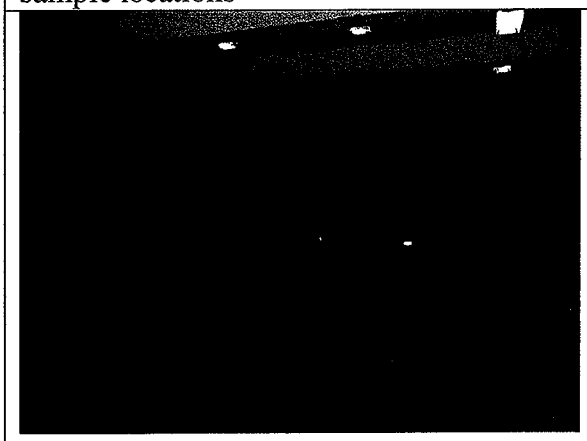

Photo 9: Former Firing Range

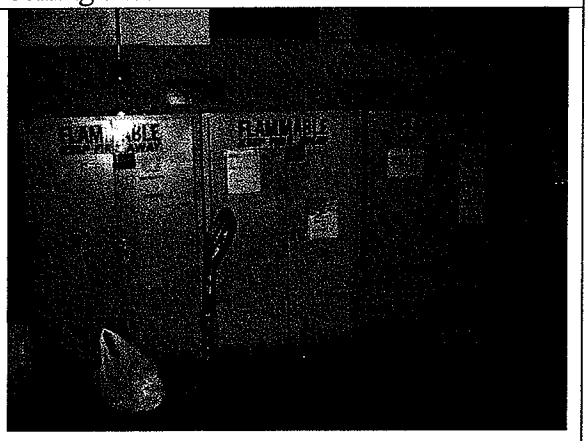

Photo 11: Former Firing Range – Flammable materials cabinets

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Photo 13: Drill Hall

Photo 23: Main Entrance – Exterior

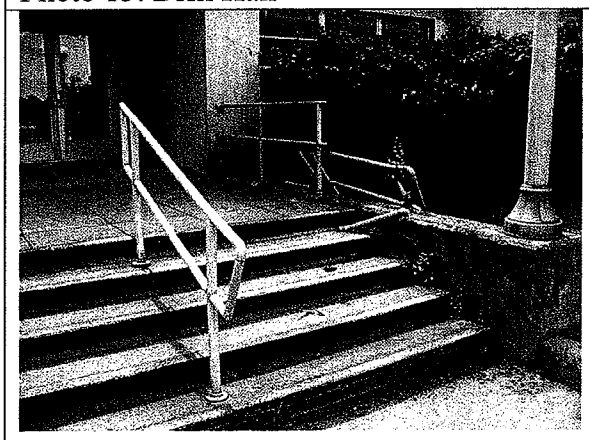

Photo 26: Main Entrance – Damaged handrail

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

FOIA Requested Record #J-15-0085 (CT)
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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15, 30 DECEMBER 2002)

FOIA Requested Record #J-15-0085 (CT)
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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 904 of 1092

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3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman ™ #40 paper

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 905 of 1092

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(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 906 of 1092

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b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 907 of 1092

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g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 908 of 1092

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b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

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Released by National Guard Bureau
Page 909 of 1092

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APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 910 of 1092

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APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 911 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From	Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 912 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 913 of 1092

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet			
Return Address		Point of Contact *(name & phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			
Sampling Data			

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 914 of 1092

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address	Point of Contact *(name/phone #)*
	Samples Collected By

Sampled Facility	City	State	Location *(bldg/area)*

Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection

Analysis Desired

Sampling Data

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer

Comments to Lab:

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 915 of 1092

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APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 916 of 1092

BEST AVAILABLE COPY

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 917 of 1092

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

INDUSTRIAL HYGIENE SURVEY REPORT
CONNECTICUT NATIONAL GUARD ARMORY
63 ARMORY ROAD
STRATFORD, CONNECTICUT 06614

December 13, 2012
PN: 39743762

Non-Responsive

Director, Industrial Hygiene Services

Non-Responsive

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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TABLE OF CONTENTS

APPENDICES

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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FINDINGS AND RECOMMENDATIONS
CONNECTICUT NATIONAL GUARD ARMORY
63 ARMORY ROAD
STRATFORD, CONNECTICUT

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance in multiple offices was determined to be inadequate.	Increase lighting in the work areas. While work is in progress, these areas must be lighted by at least the minimum lighting intensities (ANSI / IESNA RP-1-04)	RAC 4
Ergonomics		
Computer workstations in the Administrative Areas were observed with un-adjustable chairs, armrests, and keyboards.	Ergonomic issues with regard to the desks and chairs should be corrected by fitting the workplace to the worker (Department of the Army Pamphlet 40-21, Chapter 4, Page 7, Section 4-3)	RAC 3
Lead		
Lead was detected in amounts greater than 200 $\mu g/ft^2$ in the wipe samples collected from the former firing range, drill hall floor, and gun locker floor.	Personnel trained in accordance with the OSHA Lead Standard should clean the areas where elevated lead dust levels were identified. (OSHA 29 CFR 1910.1025(h)(1)).	RAC 3
Personal Protective Equipment		
The site had a personal protective equipment (PPE) program but had not determined the specific hazards for which PPE would be required.	Conduct a hazard assessment of site operations to determine what types of PPE are required for each type of work. (29 CFR 1910.132(d)(1)	RAC 3

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey of the Armory in Stratford Connecticut.

URS representative, Mr. Non-Responsive, conducted the Industrial Hygiene Survey on September 5, 2012. The scope of work included an overall assessment of the facility as it relates to industrial hygiene, and included a walkthrough of the facility, collection of photographs, and when required, measurements for illumination (light), area and personal air sampling, and noise dosimetry.

The Stratford Armory is a single-story cement block and brick building built on a concrete slab. The facility consists of 14 offices, a foyer, men's and women's lavatories, a fitness room, a classroom, men's and women's locker rooms, a cafeteria and kitchen, a storage room, supply room, and a drill floor/assembly area. A layout of the Armory is provided in Appendix A.

Asbestos-containing materials were identified during this survey. No water damage or staining was observed during this survey.

Computer workstations were assessed during the walkthrough for ergonomic issues. The computer workstations in the Facility did not meet the current Occupational Safety and Health Administration (OSHA) ergonomic recommendations. The chair armrests, keyboard, and monitor were not adjustable. All workstations in the Facility should be adjusted and monitored.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 922 of 1092

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2.0 SUPPLY AREA

2.1 Operation Description

This Armory is primarily used for weekend training drills and conducting administrative functions. The building includes offices a classroom/recreational room, a locker room, a supply area (including a vault), a kitchen, and gender separate bathrooms.

The Administrative Area was found to be neat and organized.

2.2 Chemical and Physical Agents Sampled

2.2.1 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made in the Armory. Interior carbon dioxide concentrations were between 251 and 460 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Track (Model 8551).

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is human respiration. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headaches, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

To minimize air quality complaints, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has proposed that the carbon dioxide concentration within an occupied workspace be maintained below 700 ppm above ambient outside levels. For example, on the day of the survey, the outside carbon dioxide level was measured at 332 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 923 of 1092

1,032 ppm. Using the ASHRAE guideline, the readings at the subject site were found to be below the suggested indoor to outdoor differential concentration.

2.2.2 Carbon Monoxide

The carbon monoxide concentration in the Armory was measured between 0.0 ppm and 0.5 ppm on the day of the survey. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments. Carbon monoxide was measured using a TSI Q-Track Plus (Model 8554).

Key sources of carbon monoxide within indoor environments include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.3 Relative Humidity

The average relative humidity within the Armory measured with the Q-Trak Plus, was 69.6%, which was above the guideline of less than 65% recommended by ASHRAE. The office areas are cooled by window air conditioning units not all of which were operating on the day of the survey. The outside relative humidity was measured at 78.5%. The facility is scheduled to be renovated during the winter which will include the installation of a central HVAC system.

2.2.4 Temperature

Temperature should be maintained within the thermal comfort envelope suggested in ASHRAE Standard 55-2010. This standard on thermal environments specifies conditions in which 80% or more of building occupants should find the thermal environment acceptable. ASHRAE 55-2010 suggests temperatures of 68 to 75 degrees Fahrenheit (°F), during winter months, for people in typical seasonal clothing during light sedentary activity. For summer, the temperature should be in the range of 73 to 79 °F.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 924 of 1092

The average temperature inside the Supply Area was, 74.9 °F, which was within the guideline of 73 to 79 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Armory was measured using a cal-Light 400 Light Meter. Table 2-1 below shows lighting measurements in foot-candles (FC) and the recommended lighting requirements (Illuminating Engineering Society of North America (IESNA) RP-7-01).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (FC)	Recommended Minimum Illuminance (FC)
Office 9B	Admin.	108.3	50
Office 9A	Admin.	65.2	50
Office 9 Desk 1	Admin.	68.5	50
Office 9 Desk 2	Admin.	55.2	50
Office 9 Desk 3	Admin.	59.2	50
Office 9 Desk 4	Admin.	50.0	50
Office 8 Desk 1	Admin.	55.1	50
Office 8 Desk 2	Admin.	56.7	50
Office 8 Desk 3	Admin.	**48.6**	50
Office 7 Desk 1	Admin.	65.6	50
Office 7 Desk 2	Admin.	79.8	50
Office 7 Desk 3	Admin.	68.5	50
Office 6	Admin.	**33.5**	50
Office 4 Desk 1	Admin.	52.8	50
Office 4 Desk 2	Admin.	68.7	50
Office 4 Desk 3	Admin.	54.1	50
Office 4 Desk 4	Admin.	51.7	50
Office 3	Admin.	64.4	50
Office 2 Desk 1	Admin.	**36.6**	50
Office 2 Desk 2	Admin.	**35.9**	50
Office 2 Desk 3	Admin.	55.3	50
Office 1 Desk 1	Admin.	70.6	50
Office 1 Desk 2	Admin.	51.9	50
Office 1 Desk 3	Admin.	**45.0**	50
Class Room	Class Room	35.2	30
Kitchen	Kitchen	**21.6**	50
Cafeteria	Cafeteria	42.3	10
Drill Hall	Drill Hall	47.6	10

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 925 of 1092

On the day of the survey, the illuminance at five locations within the Supply Area were determined to be inadequate. Lighting in these areas requires upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress the area must be lighted by at least the minimum light intensities.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Armory using ghost wipes, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix C. Table 2-2 below shows the results of the lead wipe testing.

Table 2-2
Levels of Lead Dust Found in the Armory

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Former Firing Range, Trap floor	1A	0.108	<110	200
Former Firing Range, 10' from trap	1B	0.108	**370**	200
Former Firing Range, 15' from trap	1C	0.108	**1300**	200
Former Firing Range 20' from trap	1D	0.108	<110	200
Stairway to range	1E	0.108	**740**	200
Building entrance, floor	2A	0.108	<110	200
Office #5, cabinet	2B	0.108	<110	200
Foyer, floor	2C	0.108	<110	200
Office #2, window sill	2D	0.108	<110	200
Classroom, desk	2E	0.108	<110	200
Room #42, storage floor	3A	0.108	<110	200
Drill Hall, floor	3B	0.108	**380**	200
Gun Locker, floor	3C	0.108	**280**	200
Lunchroom, floor	3D	0.108	<110	200
Kitchen, floor	3E	0.108	<110	200

ft^2 – Square Foot
$\mu g/ft^2$ – Micrograms per Square Foot

Three surface dust level measurements in the former firing range, and two in the drill hall area were found to contain lead at a level above the ARNG recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 926 of 1092

contamination as specified under OSHA 29 CFR 1926.62. The former firing range is currently used only for storage. URS was informed that the firing range and bullet trap had been dismantled years ago and the area had undergone a lead remediation.

Area air sampling for lead was also conducted in the Armory. The analytical report from AMA is contained in Appendix C. Table 2-3 below shows the results of the lead air sampling.

Table 2-3
Area Airborne Lead Dust Levels Found in the Supply Area

Sample Location	URS Sample Number	Volume Collected (L)	Sample Duration (min)	TWA ($\mu g/m^3$)	OSHA's PEL ($\mu g/m^3$)
Office # 4	1A	806	403	<3.7	50.0
Drill Hall	1B	786	393	<3.8	50.0

L – Liters
min – Minutes
$\mu g/m^3$ – Micrograms per Cubic Meter
TWA – Time Weighted Average

On the day of the survey, the area airborne lead dust levels in the Supply Area were found to be acceptable, below the OSHA permissible exposure limit (PEL) for lead (29 CFR 1910.1025(c)) of 50.0 micrograms per cubic meter ($\mu g/m^3$) averaged over an 8-hour day.

No painted surfaces were identified as damaged and therefore no paint chip samples were collected.

2.2.7 Asbestos

URS collected one sample for total airborne fibers in the Armory Drill Hall. The area sample was collected using a high-flow air sampling pump and a three-piece mixed cellulose ester filter cassette, having a membrane pore size of 0.8 µm. This sample was analyzed using the NIOSH 7400 Method of phase contrast microscopy. The result of this asbestos air sample is contained in Table 2-4 below.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 927 of 1092

Table 2-4
Total Airborne Fiber Sample Result – Armory Drill Hall

Sample ID	Location	Result (f/cc)	OSHA PEL (f/cc)
1A	Drill hall – Center	<0.005	0.10

f/cc – Fibers per Cubic Centimeter of Air

Bulk samples were not collected from this location because a comprehensive asbestos operations and maintenance plan was available onsite. URS confirmed the locations of the listed asbestos-containing materials and noted that all were intact and in good condition.

2.3 Ventilation System Evaluation

The facility, not designed for vehicle maintenance, contains a ventilation system that is limited to localized personal ventilation (i.e. room fans) within the majority of rooms, and main negative draw fans in the Drill Hall. Because of the height of the drill hall ceiling, airflow measurements could not be made on the day of the survey.

2.4 Noise Measurements

Only administrative tasks were being performed by personnel at the time of the survey. As a result, noise sampling was conducted in the Administrative Area. Personal noise dosimetry results indicated that, on the day of the survey, administrative personnel were exposed to noise levels below the DoD Hearing Conservation Standard (6055.12 December 3, 2010) of 85 decibels, A scale (dBA)/8-hour day. Table 2-5 indicates the locations monitored, the tasks usually preformed there, noise exposures, and hearing protection worn.

Table 2-5
Noise Dosimetry Data

Area	Task	Sample Duration (min)	Monitoring Result TWA (dBA)*	Hearing Protection
Office 6, Desk 2	Administration	330	35.1	NA
Drill Hall, Center	Equipment Demobilization	372	58.5	NA

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 928 of 1092

* The calculated 8-hour, TWA noise exposure in dBA. The OSHA PEL for noise exposure is 90 dBA. DoD has established an employee exposure level of 85 dBA for requirement of a hearing conservation program.

2.5 Personal Protective Equipment

Personal protective equipment was orderly and readily available to employees in the Armory.

2.6 Interpretation of Results

GENERAL: The Armory was neat and orderly with personal protective equipment readily available. The fire exits and extinguishers were marked and easily accessible. No water damage was observed within the Armory.

LIGHTING: The majority of the lighting in the Armory was found to adequate. Areas noted within the report as having inadequate lighting will require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress the area must be lighted by at least the minimum light intensities.

CARBON MONOXIDE: Carbon monoxide levels were found to be low. AR 385-10 requires that carbon monoxide levels be monitored by Preventive Medicine personnel. At sites where Preventive Medicine personnel are not present to routinely monitor carbon monoxide levels, AR 385-55 requires that carbon monoxide monitors be installed. Carbon monoxide detectors were observed during URS' site visit.

LEAD: The wipe samples collected in the former Armory firing range area (now used for storage), gun locker and drill hall were found to contain lead levels which exceeded the recommended limit set by the NGB, Region North IH Office. The NGB, Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix E.

The area air samples collected in the Armory were found to contain lead dust at a level below the OSHA PEL.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 929 of 1092

On the day of the survey, no paint was identified as damaged and, therefore, no paint chip samples were collected.

ASBESTOS: No damaged suspect materials were observed and, therefore, no bulk samples were collected.

An area air sample collected in the drill hall was found to have a total airborne fiber level below the OSHA PEL.

ERGONOMICS: The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker.

NOISE: Noise levels in the Armory were determined to be below the OSHA PEL and DoD Hearing Conservation Standard (6055.12 March 5, 2004) on the day of URS' site visit.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 930 of 1092

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3.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

3.1 Confined Spaces

A written confined spaces program is not applicable to this facility.

3.2 Hearing Conservation

A written hearing conservation program was identified on site.

3.3 Respiratory Protection

A written respiratory protection program is not applicable to this facility.

3.4 Hazard Communication

A site-specific hazard communication program was found onsite and included communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

Material safety data sheets, a site map and a list of full-time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A site-specific safety program regarding personal protective equipment was found on the day of inspection. The site should conduct a hazard assessment of operations to determine which operations require personal protective equipment.

3.6 Asbestos Operations and Maintenance Program

An asbestos operations and maintenance program was found onsite. URS identified confirmed asbestos-containing materials as they were listed in the sampling report.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 931 of 1092

BEST AVAILABLE COPY

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

American National Standards Institute

American National Standards Institute/Illuminating Engineering Society of North America (ANSI/IESNA) RP-1-04: American National Standard Practice for Office Lighting

ANSI/IESNA RP-7-01: Recommended Practice for Lighting Industrial Facilities

American Society of Heating, Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2010: Ventilation for Acceptable Indoor Air Quality

ANSI/ASHRAE Standard 55-2010: Thermal Environmental Conditions for Human Occupancy.

Department of the Army

DA PAM 40-21, Ergonomics Program (15 August 2003)

Unified Facilities Criteria, Heating, Ventilating and Air Conditioning, 3-520-05, April 14, 2008

DA PAM 40-501, Hearing Conservation Program, December 10, 1998.

Department of Defense

DoDI 6055.12, Hearing Conservation, 3 December 2010

Creating the Ideal Computer Workstation: A Step-by-Step Guide, June 2000

National Institute for Occupational Safety and Health

Current Intelligence Bulletin 50: Carcinogenic Effects of Exposure to Diesel Exhaust, August 1988

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 932 of 1092

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Department of Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997, 2012)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, January 13, 2003.

FOIA Requested Record #J-15-0085 (CT)
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APPENDIX A

SHOP DRAWING

FOIA Requested Record #J-15-0085 (CT)
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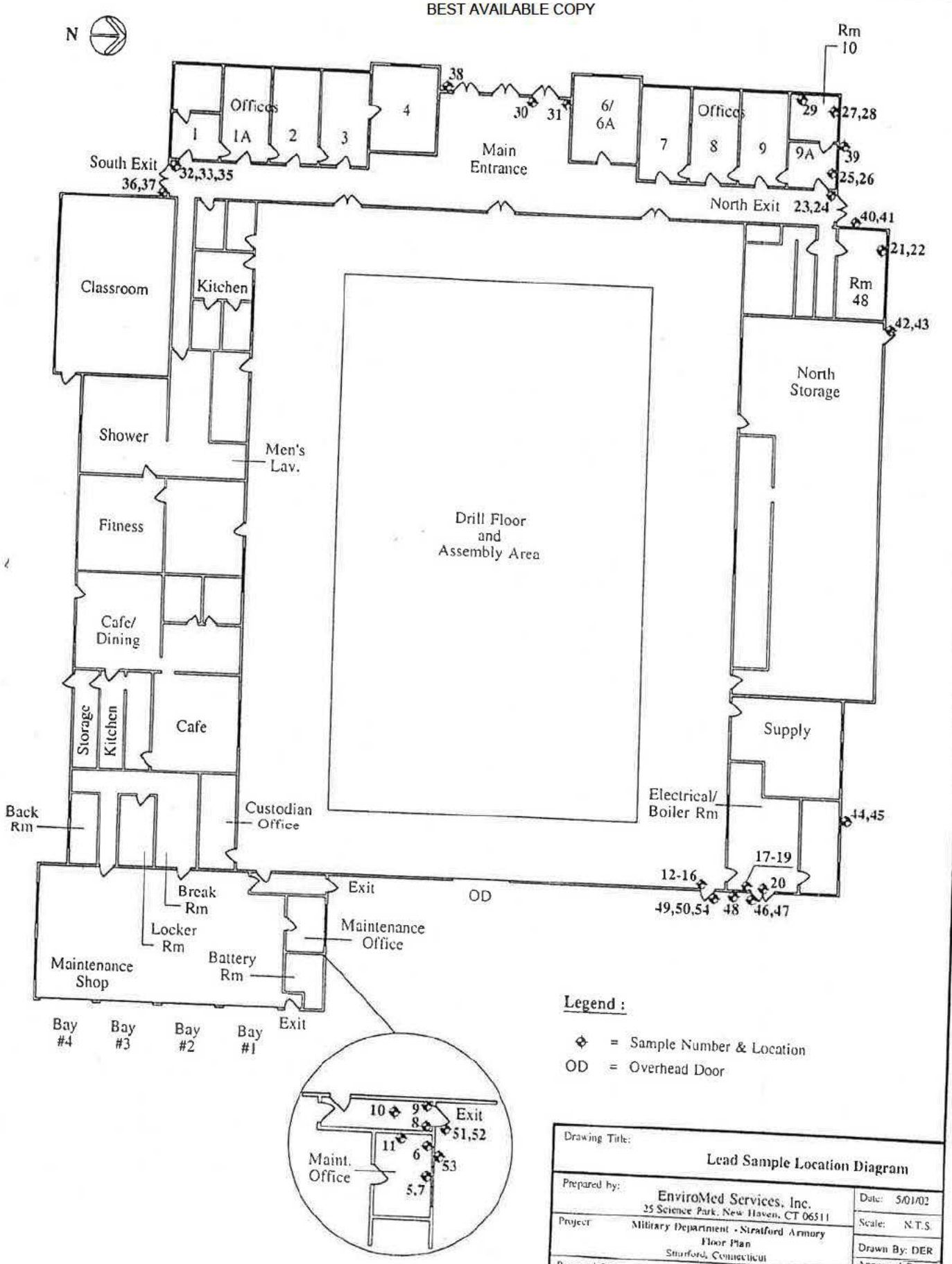

Drawing Title:	Lead Sample Location Diagram	
Prepared by:	EnviroMed Services, Inc. 25 Science Park, New Haven, CT 06511	Date: 5/01/02
Project:	Military Department - Stratford Armory Floor Plan Stratford, Connecticut	Scale: N.T.S. Drawn By: DER Approved By: DK
Prepared for:	State of Connecticut Department of Public Works Hartford, Connecticut	Drawing No. 1 of 1
EMS # IH-02-146 DPW # 59776 Client Job # BI-2H-753(Q-02-51		

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APPENDIX B

PERSONNEL LIST

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Stratford Armory 63 Armory Rd. Stratford, Ct. 06614

1. [redacted]
2.
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APPENDIX C

ANALYTICAL RESULTS

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	ANG Armory	**Chain Of Custody:**	513897
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Stratford, CT	**Date Submitted:**	9/12/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-0003	**Date Analyzed:**	9/19/2012 **Report Date:** 9/19/2012
Attention:	Non-Responsive			**Date Sampled:**	9/5/2012

Summary of Phase Contrast Microscopy

AMA Sample Number	Client Sample Number	Volume Sampled (Liters)	Fibers Per Millimeter Squared	Fibers Per Cubic Centimeter	Analyst I.D.	Sample Type	Comments
12093216	1A	790	<7*	<0.005*	RP	N/P	
12093217	1B	780	<7*	<0.005*	RP	N/P	
12093218	FB	0	<7*	*****	RP	BLK	0 fiber(s) per 100 fields

* The Reporting Limit for AMA Laboratory is 7.0 fibers per square millimeter of filter. The reporting limit for the air concentration of fibers (f/cc) is dependent on the sampled air volume. Fibers counts were determined by the methods described in NIOSH Analytical Method 7400, 'Fibers' (Revision 3, Issue 2, 8/15/94). All personnel samples were analyzed following the OSHA Reference Method.

Note: All samples were received in good condition unless otherwise noted.
Uncertainty: for fibers/mm² in the range of 7-25 the SR is 0.253, 26-64 SR=0.256, 64-127 SR=0.344, >127 SR=0.147
Sample results shown here have been corrected for any field blank(s) submitted with this sample set.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Director Non-Responsive

Analyst(s) Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by AIHA or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 513897

2 of 2

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: ANG Armory
2. Job Location: Stratford
3. Job #:
4. Contact Person: [redacted]
5. Submitted By: [redacted] Signature: [redacted]

PO #: W912K6-09-A-0003

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
❑ Immediate Date Due:
❑ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
❑ Immediate ❑ Next Day ❑ 2 Day ☒ 3 Day ☒ 5 Day + Date Due: 9/19/12
❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Incl[redacted] Report
☒ Ema[redacted]
❑ Fax
❑ Ver[redacted]

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
❑ NIOSH 7400 ____(QTY)
❑ Fiberglass ____(QTY)

TEM Air – Please Indicate Filter Type:
❑ AHERA ____(QTY)
❑ NIOSH 7402 ____(QTY)
❑ Other (specify ____) ____(QTY)

PLM Bulk
❑ EPA 600 – Visual Estimate ____(QTY)
❑ EPA Point Count ____(QTY)
❑ NY State Friable 198.1 ____(QTY)
❑ Grav. Reduction ELAP 198.6 ____(QTY)
❑ Other (specify ____) ____(QTY)

MISC
❑ Vermiculite
❑ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

TEM Bulk
❑ ELAP 198.4/Chatfield ____(QTY)
❑ NY State PLM/TEM ____(QTY)
❑ Residual Ash ____(QTY)

TEM Dust
❑ Qual. (pres/abs) Vacuum/Dust ____(QTY)
❑ Quan. (s/area) Vacuum D5755-95 ____(QTY)
❑ Quan. (s/area)Dust D6480-99 ____(QTY)

TEM Water
❑ Qual. (pres/abs) ____(QTY)
❑ ELAP 198.2/EPA 100.2 ____(QTY)
❑ EPA 100.1 ____(QTY)

☒ All samples received in good condition unless otherwise noted.
(TEM Water samples ____ °C)

Metals Analysis
❑ Pb Paint Chip ____(QTY)
☒ Pb Dust Wipe (wipe type Ghost) 6 (QTY)
☒ Pb Air 3 (QTY)
❑ Pb Soil/Solid ____(QTY)
❑ Pb TCLP ____(QTY)
❑ Drinking Water ❑ Pb ____(QTY) ❑ Cu ____(QTY) ❑ As ____(QTY)
❑ Waste Water ❑ Pb ____(QTY) ❑ Cu ____(QTY) ❑ As ____(QTY)
❑ Pb Furnace (Media ____) ____(QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
❑ Spore-Trap ____(QTY)
❑ Surface Swab ____(QTY)
❑ Surface Tape ____(QTY)
❑ Other (Specify ____) ____(QTY)
❑ Surface Vacuum Dust ____(QTY)
❑ Culturable ID Genus (Media ____) ____(QTY)
❑ Culturable ID Species (Media ____) ____(QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
3A	Rm 42 Floor	9/5/12		100cm²				X								
3B	Drill Hall Floor															
3C	Gun locker															
3D	Lunchroom															
3E	Kitchen floor															
FB (Pb Dust)	–			–												
1A	Drill Hall		790			X										
1B	Acc office		780			X										
FB (PCM)	–					X										
1A	Drill Hall		806				X									
1B	Acc office		786				X									
FB (Pb Air)	–						X									

CLIENT CONTACT
(LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 9/12/12 @ 1430 Via: FED
2. Date/Time Analyzed: 9/19/12 @ 100 By (Print): [redacted]
3. Results Reported To: all above Via: email Date: 9/19/12 @ 1330
4. Comments:

[redacted]

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ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	ANG Armory	**Chain Of Custody:**	513897
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Stratford, CT	**Date Submitted:**	9/12/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-0003	**Date Analyzed:**	9/17/2012 **Report Date:** 9/17/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
12093197	1A	Flame	Air	806	N/A	3.7	ug/m^3	<3	<3.7	ug/m^3	
12093198	1B	Flame	Air	786	N/A	3.8	ug/m^3	<3	<3.8	ug/m^3	
12093199	1C	Flame	Air Blank	0	N/A	3	ug/m^3		<3	ug	
12093200	1A	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12093201	1B	Flame	Wipe	****	0.108	110	ug/ft^2	40	370	ug/ft^2	
12093202	1C	Flame	Wipe	****	0.108	110	ug/ft^2	140	1300	ug/ft^2	
12093203	1D	Flame	Wipe	****	0.108	110	ug/ft^2	28	260	ug/ft^2	
12093204	1E	Flame	Wipe	****	0.108	110	ug/ft^2	80	740	ug/ft^2	
12093205	2A	Flame	Wipe	****	0.108	110	ug/ft^2	18	160	ug/ft^2	
12093206	2B	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12093207	2C	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12093208	2D	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12093209	2E	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12093210	3A	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12093211	3B	Flame	Wipe	****	0.108	110	ug/ft^2	41	380	ug/ft^2	
12093212	3C	Flame	Wipe	****	0.108	110	ug/ft^2	31	280	ug/ft^2	
12093213	3D	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12093214	3E	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12093215	FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	ANG Armory	**Chain Of Custody:**	513897
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Stratford, CT	**Date Submitted:**	9/12/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-0003	**Date Analyzed:**	9/17/2012 **Report Date:** 9/17/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Anal Non-Responsive

Technical Manage Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 513897

1 of 2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: ANG Armory
2. Job Location: Stradford
3. Job #: _____ P.O. #: W912K6-09-A-0003
4. Contact Person: Non-Responsive
5. Submitted By: Non-Responsive Signature: Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: _____	☐ Immediate ☒ 3 Day NOW	☒ Inc Non-Responsive port
☐ 24 Hours Time Due: _____	☐ Next Day ☒ 5 Day +	☒ Ma ars.com
Comments: _____	☐ 2 Day Date Due: 9/19/12	☐ Fa rmy.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ Ve rmy.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 3 (QTY)
☐ Fiberglass _____ (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA _____ (QTY)
☐ NIOSH 7402 _____ (QTY)
☐ Other (specify _____) _____ (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate _____ (QTY)
☐ EPA Point Count _____ (QTY)
☐ NY State Friable 198.1 _____ (QTY)
☐ Grav. Reduction ELAP 198.6 _____ (QTY)
☐ Other (specify _____) _____ (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield _____ (QTY)
☐ NY State PLM/TEM _____ (QTY)
☐ Residual Ash _____ (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust _____ (QTY)
☐ Quan. (s/area) Vacuum D5755-95 _____ (QTY)
☐ Quan. (s/area)Dust D6480-99 _____ (QTY)
TEM Water
☐ Qual. (pres/abs) _____ (QTY)
☐ ELAP 198.2/EPA 100.2 _____ (QTY)
☐ EPA 100.1 _____ (QTY)

☐ All samples received in good condition unless otherwise noted.
(TEM Water samples _____ °C)

Metals Analysis
☐ Pb Paint Chip _____ (QTY)
☒ Pb Dust Wipe (wipe type Ghost) 16 Non-Resp (QTY)
☐ Pb Air 3 (QTY)
☐ Pb Soil/Solid _____ (QTY)
☐ Pb TCLP _____ (QTY)
☐ Drinking Water ☐ Pb____(QTY) ☐ Cu____(QTY) ☐ As____(QTY)
☐ Waste Water ☐ Pb____(QTY) ☐ Cu____(QTY) ☐ As____(QTY)
☐ Pb Furnace (Media _____) _____ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: _____
Collection Media _____
☐ Spore-Trap _____ (QTY) ☐ Surface Vacuum Dust _____ (QTY)
☐ Surface Swab _____ (QTY) ☐ Culturable ID Genus (Media _____) _____ (QTY)
☐ Surface Tape _____ (QTY) ☐ Culturable ID Species (Media _____) _____ (QTY)
☐ Other (Specify _____) _____ (QTY)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
1A	Trap Floor	9/5/12		100 cm²				X									Date/Time: Contact: By:
1B	10'																
1C	15'																
1D	20'																
1E	Stairway																Date/Time: Contact: By:
2A	office stair																
2B	OBS Cabinet																
2C	entrance																
2D	# 2 window sill																Date/Time: Contact: By:
2E	Classroom																

Non-Responsive

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 9 / 12 / 12 @ 1430 Via: Fedex By (Print) Non-Responsive Sign: _____
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): _____ Sign: _____
3. Results Reported To: _____ Via: _____ Date: ____ / ____ / ____ Time: _____ Initials: _____
4. Comments: Non-Responsive @urs.com

* Email Results to

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FOIA Requested Record #J-15-0083 (CT)
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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 513897 2of2

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: ANG Armory
2. Job Location: Stratford
3. Job #: PO #: W912K6-09-A-0003
4. Contact Person: Non-Responsive
5. Submitted By: Non-Responsive Signature: Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☑ 3 Day NKM
☐ Next Day ☑ 5 Day +
☐ 2 Day Date Due: 9/19/12
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☑ Include COC/Field Data Sheet in Report
☑ Email: Non-Responsive @urs.com
☐ Fax:
☐ Verbal:

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
☑ NIOSH 7400 3 (QTY)
☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)

PLM Bulk
☐ EPA 600 – Visual Estimate (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)

MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)

TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☑ All samples received in good condition unless otherwise noted.
(TEM Water samples ____ °C)

Metals Analysis
☐ Pb Paint Chip (QTY)
☑ Pb Dust Wipe (wipe type Ghost) 6 (QTY)
☑ Pb Air 3 (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
3A	Rm 42 Floor	9/5/12		100cm²				X								
3B	Drill Hall Floor															
3C	Gun locker															
3D	Lunchroom															
3E	Kitchen Floor															
FB (Pb Dust)	–															
1A	Drill Hall		790			X										
1B	Acc office		780			X										
FB (PCM)	–					X										
1A	Drill Hall		806				X									
1B	Acc office		786				X									
FB (Pb Air)	–						X									

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Date/Time:	Contact:	By:
Date/Time:	Contact:	By:
Date/Time:	Contact:	By:

Non-Responsive

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 9/12/12 @ 1430 Via: Fedex By (Print):
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / /
4. Comments:

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* Email Results to Non-Responsive@urs.com

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APPENDIX D

PHOTOGRAPHIC LOG

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URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
CT ARNG - Stratford Armory	63 Armory Road, Stratford, Connecticut 06614	39743762

Photo No.	Date:
1	9/5/12

Description:

Properly labeled and locked out empty flammable cabinet and gas cylinder.

Photo No.	Date:
2	9/5/12

Description:

Improperly stored spray paint containers and paints.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 946 of 1092

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URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
CT ARNG - Stratford Armory	63 Armory Road, Stratford, Connecticut 06614	39743762

Photo No.	Date:
3	9/5/12

Description:

Spill response kit and location of MSDS' signage.

Photo No.	Date:
4	9/5/12

Description:

Computer work stations.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 947 of 1092

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APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

FOIA Requested Record #J-15-0085 (CT)
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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (µg/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

    a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft²) and windowsills (250 µg/ft²) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

    b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

    c. OSHA used to cite a level of 200 µg/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

    d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 µg/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

    e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 949 of 1092

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correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

   a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

   b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

   c. Post signs in the area to inform people of the presence of lead dust and its effects.

   d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

   e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 milligrams per cubic meter (mg/m^3) averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 950 of 1092

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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, Connecticut 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
WATERBURY ARMORY
WATERBURY, CONNECTICUT

February 2006
PN: 39741509

Non-Responsive

Office Manager

Non-Responsive

Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 951 of 1092

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TABLE OF CONTENTS

Section **Page**

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TABLE OF CONTENTS (Cont.)

APPENDICES

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate.	Increase illumination through use of task lighting. (ANSI / IESNA RP-1-04)	RAC 4
Ergonomic		
Computer work stations were observed with fixed chairs, armrests, keyboards and monitors.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (DoD, OSHA General Duty)	RAC 3
Lead		
Lead was detected in wipe samples collected from the drill hall in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range and administrative area where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Waterbury Armory located at 64 Field Street in Waterbury, Connecticut. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On August 4, 2005, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Waterbury, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lieutenant Non-Responsive of the Connecticut ARNG was Mr. Non-Responsive site contact for this survey.

This armory is a three-story brick building, with an attached drill hall, that is constructed primarily of brick and mortar. This facility is built on a concrete slab, hardwood floors on the upper levels with a pitched asphalt roof. The building was constructed in 1923. A layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A. The building was renovated in 1986 with abatement of all friable asbestos containing materials, including thermal systems insulation.

Due to equipment malfunction no photographs were taken at this facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 955 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Many computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards in offices could not be adjusted. Computer monitors could not be adjusted for different individuals working at the workstations. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning the workstations at the time of this survey.

Paints and thinners and other chemicals were located in the flammable storage lockers with hazard communication information.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the drill hall, mess hall, boiler room, readiness room, classroom, drill floor and outside. These readings were all measured using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity levels on the day of the survey ranged from 41.2-48 % throughout the various building areas with an average of 43.4%. The average reading was below the recommended maximum level of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004).

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from a low of 531 to a spike of 735 parts per million (ppm), with an average of 569 ppm. The outside reading was 545 ppm.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 956 of 1092

BEST AVAILABLE COPY

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above background level. Given a background level of 545 ppm on the day of the survey, the ASHRAE limit would be 1,245 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 4.0 to 5.0 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments (62.1-2004) but higher than is usually seen in an office environment. Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative area was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 957 of 1092

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recommended lighting requirement (ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting – Table B-1).

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting lux (foot candles)	Recommended Lighting lux (foot candles)
Mess Hall Center	Dining	194 (18.02)	300 (30)
Conference Room 321	Conference	413 (38.37)	500 (50)
143rd Logistics	Administration	720 (66.89)	500 (50)
A-6 Office 124, Orderly room	Administration	947 (87.97)	500 (50)
3rd Floor Hall Outside Latrine	Hall	123.4 (11.46)	200 (20)
TRD Command Orderly	Administrative	480 (44.59)	500 (50)
TRD Command	Administrative	655 (60.85)	500 (50)
B-Co Orderly	Administrative	680 (63.17)	500 (50)
2nd Floor Conference	Administrative	280 (26)	500 (50)
Recruiting Office	Administrative	194 (18)	500 (50)
2nd Floor Northeast Classroom	Administrative	319.5 (29.68)	500 (50)
Hall Outside Classrooms 1-2	Hall	158 (14.68)	200 (20)
Classroom #2	Administrative	765 (71)	500 (50)

On the day of the survey, lighting levels were inadequate in most offices.

2.2.5 Lead

A paint chip sample was collected in the facility, since peeling paint was observed on the plaster wall between the attic and the roof. Results indicated that the sample contained 0.025% lead. Lead paint levels of lead greater than 0.5% by weight are referred to as "lead-containing" (Section 1017 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)).

One air sample for lead dust was also collected in the former firing range. Table 2-2 below shows the result of this air sample.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 958 of 1092

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Table 2-2
Airborne Concentrations of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	Lead Action Level ($\mu g/m^3$)
Mess Hall Center	0804-01	359	<8.4	30.0
Blank	0804-03	N/A	<3	N/A

On the day of the survey, the airborne lead dust levels in the mess hall were found to be below the OSHA action level of 30.0 $\mu g/m^3$ averaged over an 8-hour day.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The ergonomic issues with the desks, chairs and monitors should be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey the illumination in the administrative area was inadequate in approximately 50% of the offices and generally throughout the facility. URS recommends increasing the area lighting or supplement task lighting for each workstation in the administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 959 of 1092

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3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now primarily used for storage.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was not conducted in the former firing range area. The location of this area could not be determined.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: Lead sampling was not performed in this area.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 960 of 1092

BEST AVAILABLE COPY

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a hard wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall Southeast, Top of Electrical Box	0804-04	10x10 cm	770	200
Drill Hall, Northeast	0804-05	10x10 cm	760	200
Drill Hall, center, floor	0804-06	10x10 cm	9.5	200
Drill Hall Northwest, Top of Extinguisher Box	0804-07	10x10 cm	530	200
Drill Hall Southwest, Top of Extinguisher Box	0804-08	10x10 cm	120	200
Blank	0804-14	N/A	<2.8	200

Sample numbers and locations can be found on the site map in Appendix A.

Air samples for lead dust were collected from mess hall and drill floor. Table 4-2 below shows the results of these air samples.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 961 of 1092

Table 4-2
Airborne Concentrations of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	Lead Action Level ($\mu g/m^3$)
Drill Hall Center	0804-02	256	<12	30.0
Blank	0804-03	N/A	<3	N/A

Sample number and location can be found on the site map in appendix A.

On the day of the survey, the airborne lead dust levels in the drill hall was found to be below the OSHA action level of 30.0 $\mu g/m^3$ averaged over an 8-hour day.

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: Wipe samples collected from the drill hall for lead were found to be above allowable limits and the drill hall requires cleaning and further testing. The NGB Region North IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix F.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 962 of 1092

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5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

No chemical or physical agents were sampled in this area.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

ASBESTOS: Asbestos-containing pipe insulation in the boiler room was observed to be in good condition (Photo # 0779).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 963 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

A site-specific hazard communication program was found regarding hazard communication. Training records are maintained at the Connecticut AASF.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 964 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/IESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities For Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 965 of 1092

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APPENDIX A

ARMORY DRAWING

FOIA Requested Record #J-15-0085 (CT)
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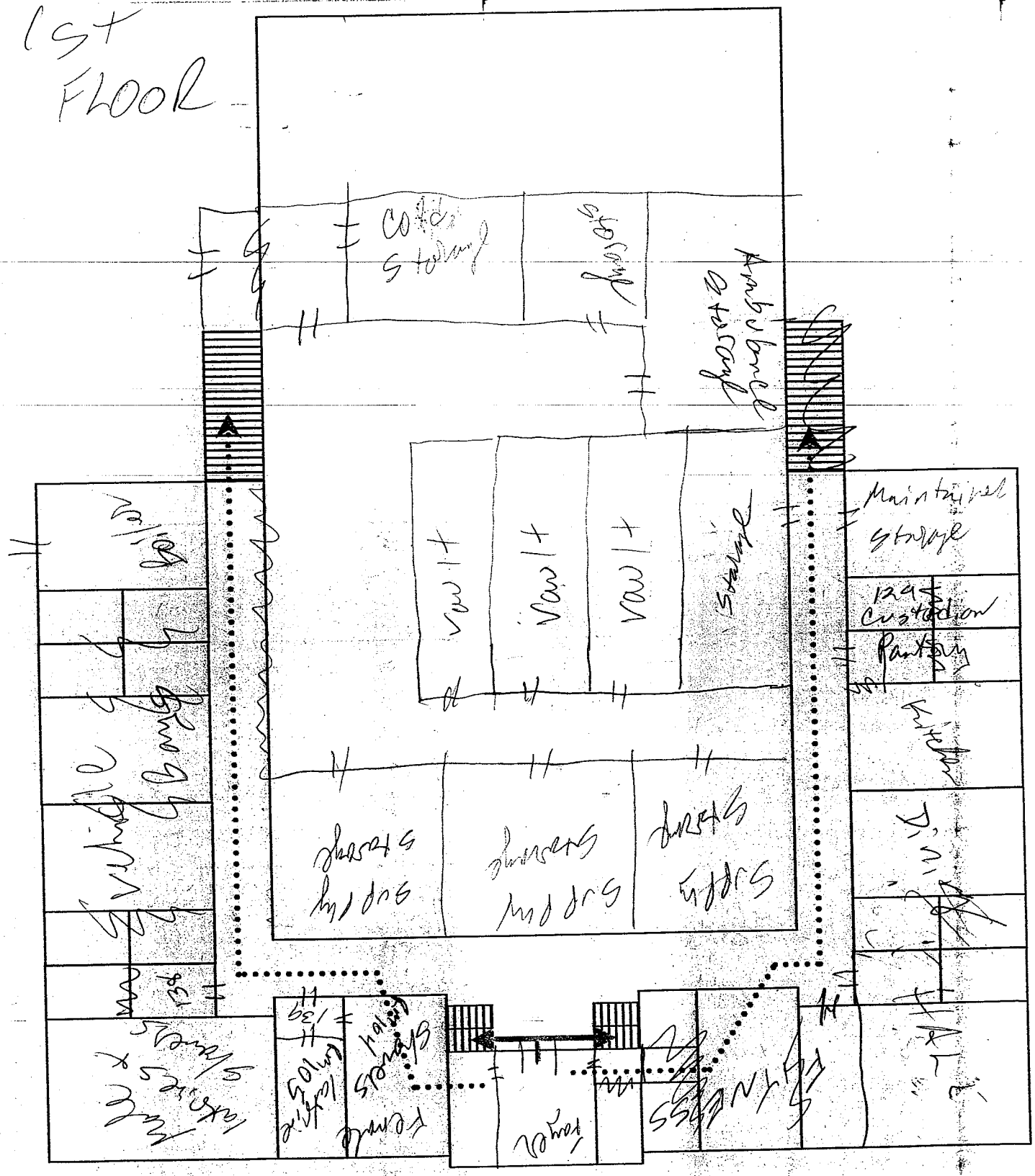
Building Evacuation Routes



FOIA Requested Record #J-15-0085 (CT)
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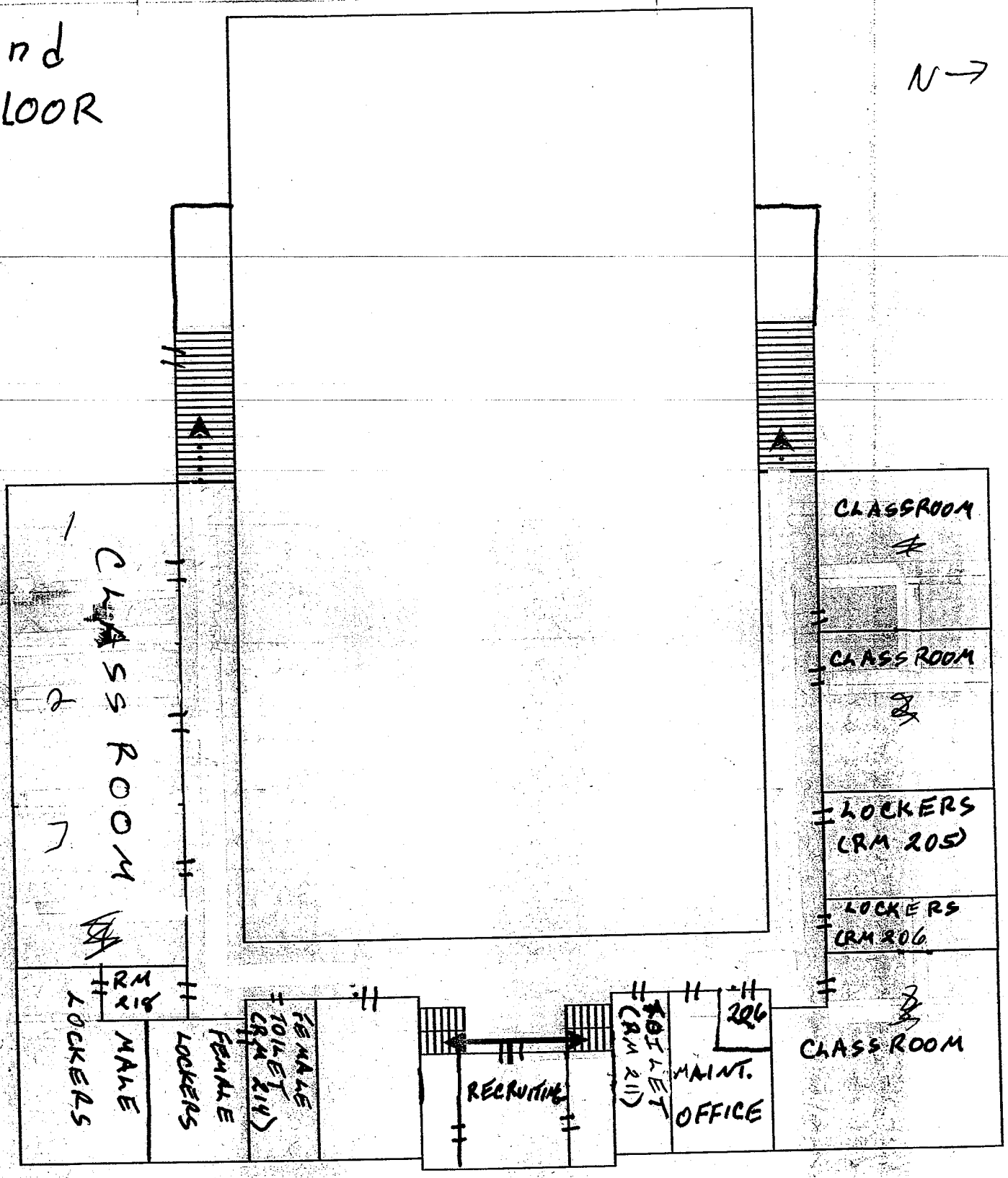
WATERBURY ARMORY

2nd FLOOR

N →



FOIA Requested Record #J-15-0085 (CT)
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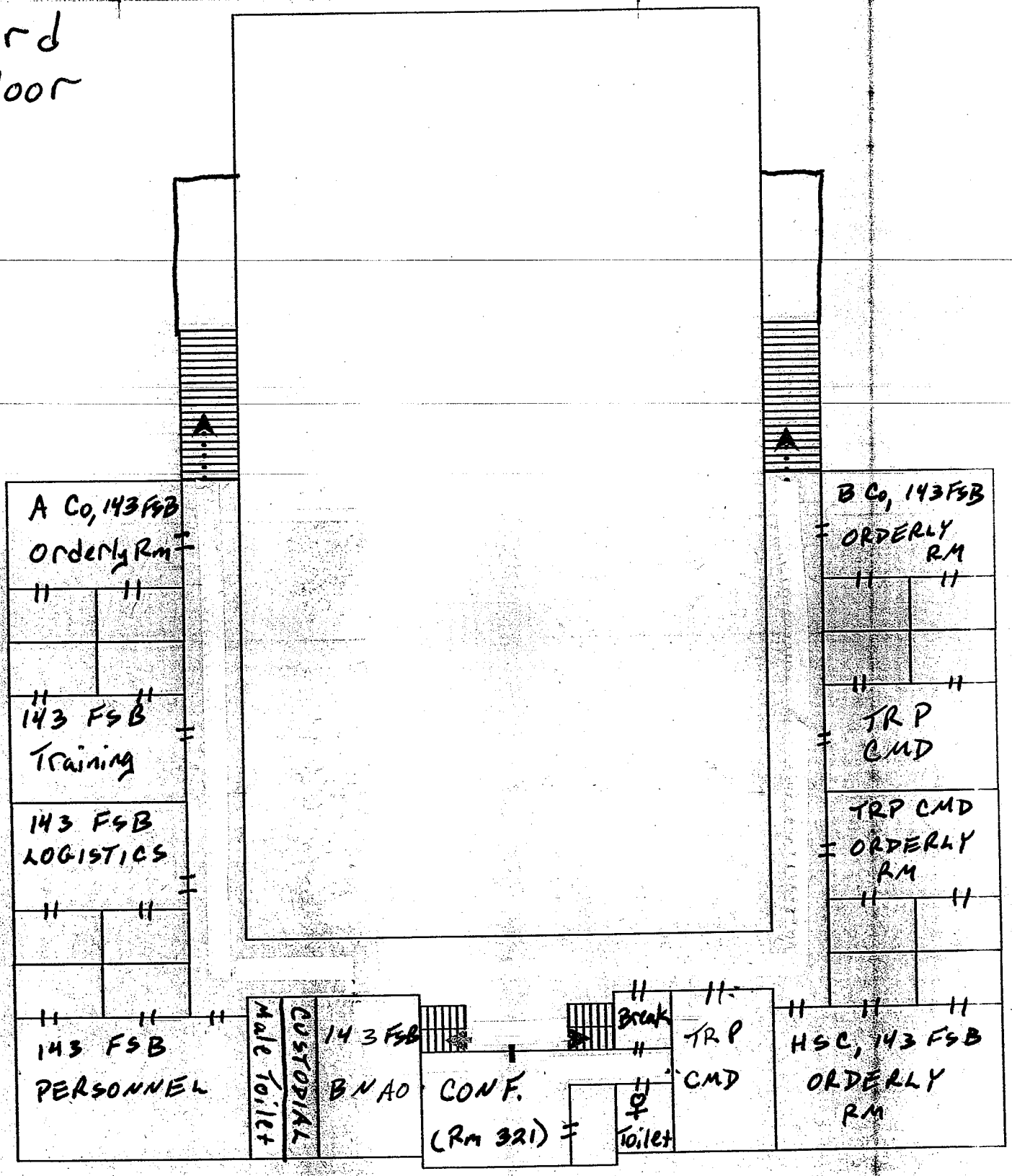
WATERBURY, CT ARMORY

3rd Floor



FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 993 of 1092

BEST AVAILABLE COPY

APPENDIX B

PERSONNEL LIST

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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APPENDIX C

HAZARDOUS MATERIALS LIST

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APPENDIX D

ANALYTICAL RESULTS

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NO. 958 P05
16038936240 BEST AVAILABLE COPY MONITORING AEROSOL 14:25 5002/91/80
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 975 of 1092

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Waterbury Armory	**Chain Of Custody:**	141924		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Waterbury, CT	**Date Submitted:**	8/12/2005		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	Not Provided	**Date Analyzed:**	8/19/2005	**Report Date:**	19-Aug-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result			Comments
0559070	0804-01	Flame	Air	359	N/A	8.36	ug/m³	<	8.4	ug/m³	
0559071	0804-02	Flame	Air	256	N/A	11.72	ug/m³	<	12	ug/m³	
0559072	0804-03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	
0559073	0804-26	Flame	Paint Chip	****	N/A	0.01	%Pb		0.025	%Pb	
0559074	0804-04	Furnace	Wipe	****	0.108	139.41	ug/ft²		770	ug/ft²	
0559075	0804-05	Furnace	Wipe	****	0.108	139.41	ug/ft²		760	ug/ft²	
0559076	0804-06	Furnace	Wipe	****	0.108	2.79	ug/ft²		9.5	ug/ft²	
0559077	0804-07	Furnace	Wipe	****	0.108	139.41	ug/ft²		530	ug/ft²	
0559078	0804-08	Furnace	Wipe	****	0.108	34.85	ug/ft²		120	ug/ft²	
0559079	0804-09	Furnace	Wipe	****	0.108	2.79	ug/ft²		4.9	ug/ft²	
0559080	0804-10	Furnace	Wipe	****	0.108	2.79	ug/ft²	<	2.8	ug/ft²	
0559081	0804-11	Furnace	Wipe	****	0.108	2.79	ug/ft²		5.3	ug/ft²	
0559082	0804-12	Furnace	Wipe	****	0.108	2.79	ug/ft²		7	ug/ft²	
0559083	0804-13	Furnace	Wipe	****	0.108	2.79	ug/ft²		26	ug/ft²	
0559084	0804-14	Furnace	Wipe	****	0.108	2.79	ug/ft²	<	2.8	ug/ft²	

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Page 976 of 1092

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Waterbury Armory	**Chain Of Custody:**	141924		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Waterbury, CT	**Date Submitted:**	8/12/2005		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	Not Provided	**Date Analyzed:**	8/19/2005	**Report Date:**	19-Aug-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)
%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.
Air and Wipe results are not corrected for any blank results

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: [redacted] **Technical Manager:** [redacted]

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APPENDIX E

TRAINING CERTIFICATES

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Non-Responsive

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T-877 P 04/06 F-281

Certificate of Training

Awarded to

[redacted] Non-Responsive

For successful completion of an 8 Hour, 1 Day

Asbestos Inspector & Management Planner

Annual Refresher Training

MARCH 25, 2003

This training was approved and given in accordance with Regulations for Connecticut State Agencies RCSA 20-440 - 1-9 and RCSA 20-441 and meets the requirements of the EPA Revised MAP under TSCA Title II of 4/4/94

Presented by

Mystic Air Quality Consultants, Inc.

1204 North Road, Groton, CT 06340 (800) 247-7746

Certificate Number: IMPR10543 **Exam Grade:** 100%

Exam Date: 03/25/2003

[redacted] Non-Responsive

CIH, CSP, RS

[redacted] Non-Responsive

te: 03/25/2004

raining Director

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 970 of 1062

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APPENDIX F

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

FOIA Requested Record #J-15-0085 (CT)
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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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Industrial Hygiene Survey

Connecticut Army National Guard (CT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Waterbury Readiness Center
64 Field Street
Waterbury, CT 06702

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: August 30, 2012

AEI Project #: J12-676 3h CT Waterbury RC

_____

Non-Responsive **CIH, CSP, LEED Green Associate**
Industrial Hygienist

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 983 of 1092

Table of Contents

List of Tables and Appendices

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 984 of 1092

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) Waterbury Readiness Center located at 64 Field Street, Waterbury, CT 06702. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 30, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the walls in the Boiler Room and in Custodian Closet #129 and on the floor near the Kitchen and Mess Hall. Paint chip samples were collected and submitted for lead analysis. The paint chip samples were found to contain less than 0.5% lead by weight which is not considered lead-based paint. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for one sample collected in the Drill Hall and one sample from a locker room floor.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged cove base with tan mastic was observed in a locker room, and a bulk sample was collected. No asbestos was detected in the sample.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of mold growth was observed on the day of the inspection; however, water intrusion was observed in the form of concrete efflorescence in Custodian Closet #129 and several stained ceiling tiles were observed throughout the building.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable with room for improvement in some areas due to dust accumulation.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a several areas due to spacing between lights and burned out bulbs. The illumination measurements indoors ranged from 1 foot candle (fc) to 228 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly within the comfort ranges for the summer season on the day of the survey. The outdoor temperature and relative humidity were 81.1° F and 33.9% on the day of monitoring, and indoor conditions were similar to outdoor conditions. The facility has window air-conditioning units in some areas, but the majority of the building is not air-conditioned. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide were below the recommended concentrations in all areas except for CO_2 concentrations in four offices with several occupants each ranging from 1,163 ppm to 1,391 ppm.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 985 of 1092

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available as per the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200. MSDSs were readily available and up to date. It is recommended that the written hazard communication program be placed in every MSDS notebook along with any related training records.

Overall, the Waterbury Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 986 of 1092

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) Waterbury Readiness Center located at 64 Field Street, Waterbury, CT 06702. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 30, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Waterbury Readiness Center was built in the 1920's with several more recent renovations. The readiness center is staffed by approximately 20 National Guard administrative personnel, 1 part time civilian caretaker (maintainer) and a civilian family readiness administrator. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Waterbury Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Waterbury facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state employed maintainer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 987 of 1092

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for damaged building materials that may contain asbestos or lead-based paint, for water damage or mold problems; for potential ergonomic problems; and for housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the walls in the Boiler Room and in custodial closet #129, and on the floor near the kitchen and mess hall. Paint chip samples were collected and submitted for lead analysis. Results are given in Table 1 and certificates of analysis are included in Appendix B. All of the paint chip samples were below 0.5% lead by weight and are not considered lead-based paint.

Table 1 – Results of Paint Chip Sampling for CTARNG Waterbury Readiness Center on August 30, 2012.

Sample #	Sample Location	Lead Result (% by wt)
WTBY-Bulk-02	On Wall in Boiler Room	0.017
WTBY-Bulk-03	On Wall in Custodian Closet #129	0.0074
WTBY-Bulk-04	On floor near the kitchen and mess hall	<0.011

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the state of Connecticut limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical Services, Inc. (AMA) of Lanham, MD for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Wipe samples collected from the facility were below the recommended maximum level for surface contamination in all areas sampled except for one sample collected from the Drill Hall floor and one sample from a painted concrete floor in a locker room. Surfaces contaminated with lead dust should be cleaned using wet methods or high efficiency particulate air (HEPA)-filtered vacuums. Results are given in Table 2 and certificates of analysis are included in Appendix B.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 988 of 1092

Table 2 – Results of Dust Wipe Sampling for CTARNG Waterbury Readiness Center on August 30, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
WTBY-W01	3rd Floor Kitchenette – floor	<110
WTBY-W02	3rd Floor Office near kitchenette – window sill	<110
WTBY-W03	3rd Floor Kitchenette – floor	<110
WTBY-W04	Locker room #1 – window sill	190
WTBY-W05	Locker room #2 – floor unfinished concrete	**530**
WTBY-W06	Empty office suite – window sill	<110
WTBY-W07	Classroom with sunken desks – desk top	<110
WTBY-W08	Classroom with short desks – VCT floor	<110
WTBY-W09	Mess Hall – window sill	<110
WTBY-W10	Mess Hall – serving counter	<110
WTBY-W11	Mess Hall – floor	<110
WTBY-W12	Drill Hall – center of floor	<110
WTBY-W13	Drill Hall – floor left of main entrance	<110
WTBY-W14	Drill Hall – floor near exit doors	<110
WTBY-W15	Drill Hall – floor right of bay door	**270**
WTBY-W16	Drill Hall – right of main entrance	<110
WTBY-W17	Former Firing Range – Storage Room #1 – floor – painted concrete	140
WTBY-W18	Former Firing Range – Storage Room #2 – floor – painted concrete	<110
WTBY-W19	Former Firing Range – Storage Room #3 – floor – painted concrete	180
WTBY-W20	Fitness Center – window sill	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft^2) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged cove base with tan mastic were observed in a locker room, and a bulk sample of the mastic was collected. The sample was submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). The EPA defines an asbestos-containing material as

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 989 of 1092

one percent (1%) or more asbestos by visual estimation. No asbestos was detected in the tan mastic.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of mold growth was observed on the day of the inspection; however, water intrusion was observed on a brick wall in custodian closet #129 in the form of concrete efflorescence and moisture and stained ceiling tiles were observed in certain parts of the building.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable with room for improvement in some areas due to dust accumulation.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas due to spacing between lights or bulbs being blown out. The illumination measurements indoors ranged from 1 foot candles (fc) to 228 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 3. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 990 of 1092

Table 3 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 73.2 to 83.4° F and 33.3 to 46.6% Rh. Temperature and relative humidity measurements were mostly acceptable compared to the comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 81.1° F and 33.9%, and conditions inside were similar to the outdoor conditions. This readiness center has window air-conditioning units in some areas but the majority of the building is not air-conditioned.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 409 to 1,391 parts per million (ppm). The outdoor CO_2 concentration was 397 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas except for four offices that had several occupants at the time of monitoring.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.0 to 1.0 ppm; therefore all measurements were below the concentrations of concern.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available per OSHA 29 CFR 1910.1200. MSDSs were readily available and up to date. It is recommended that the written hazard communication program be placed in every MSDS notebook along with any related training records.

7 Conclusions

The results of the evaluation indicated a few minor concerns at the facility. Overall, the Waterbury Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 991 of 1092

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 992 of 1092

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12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 993 of 1092

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Appendix A
Building Layout

FOIA Requested Record #J-15-0085 (CT)
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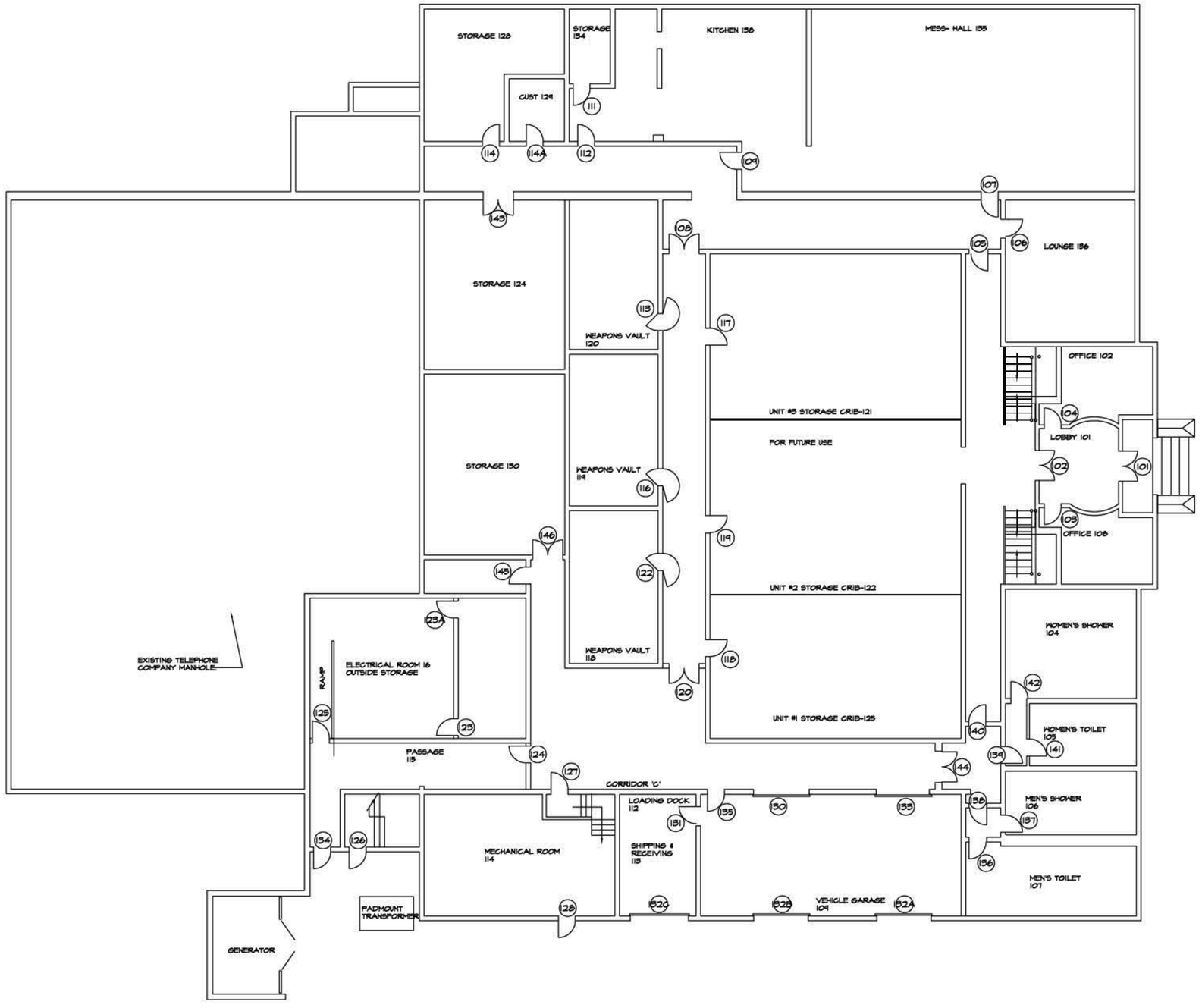

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\\Ct-04050-fmo\DPW\Installations\WA - Waterbury (1850)\Buildings Information\WA - Building 001 Armory\Base Plans\ WA 001 01.dwg Jan 24, 2007 - 10:05am

FIRST FLOOR PLAN

24 JAN 2007

0' X'

WA - WATERBURY ARMORY
CONNECTICUT ARMY NATIONAL GUARD

WATERBURY, CONNECTICUT

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STATE OF CONNECTICUT
MILITARY DEPARTMENT
Facilities Management Office
360 Broad Street Hartford, CT 06105
860.493.2725 Fax 860.524.4932

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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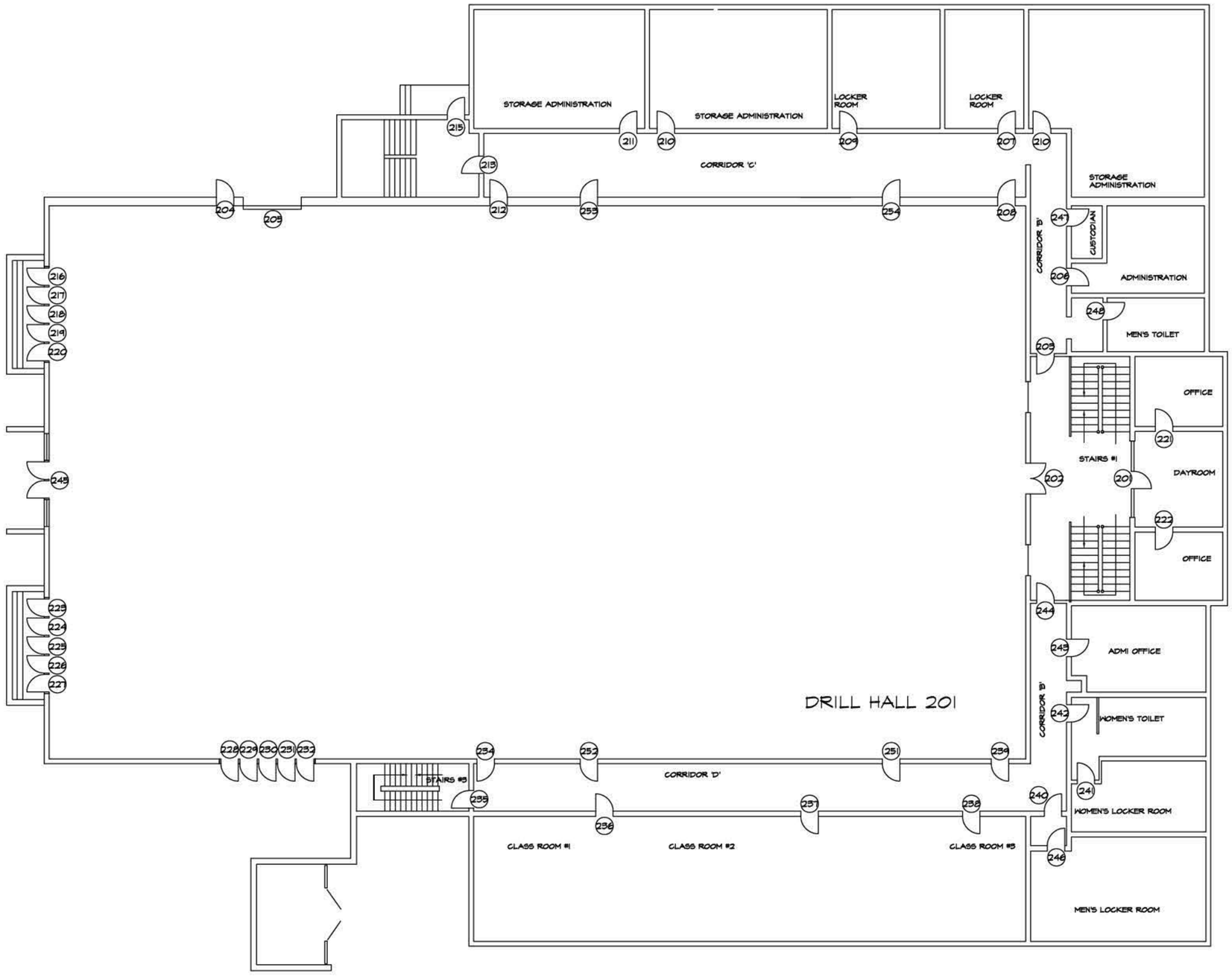

DRAWN BY: XX
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SECOND FLOOR PLAN

24 JAN 2007

0' X'

WA - WATERBURY ARMORY
CONNECTICUT ARMY NATIONAL GUARD

WATERBURY, CONNECTICUT

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STATE OF CONNECTICUT
MILITARY DEPARTMENT

Facilities Management Office
360 Broad Street Hartford, CT 06105
860.493.3725 Fax 860.524.4937

FOIA Requested Record #J-15-0085 (CT)
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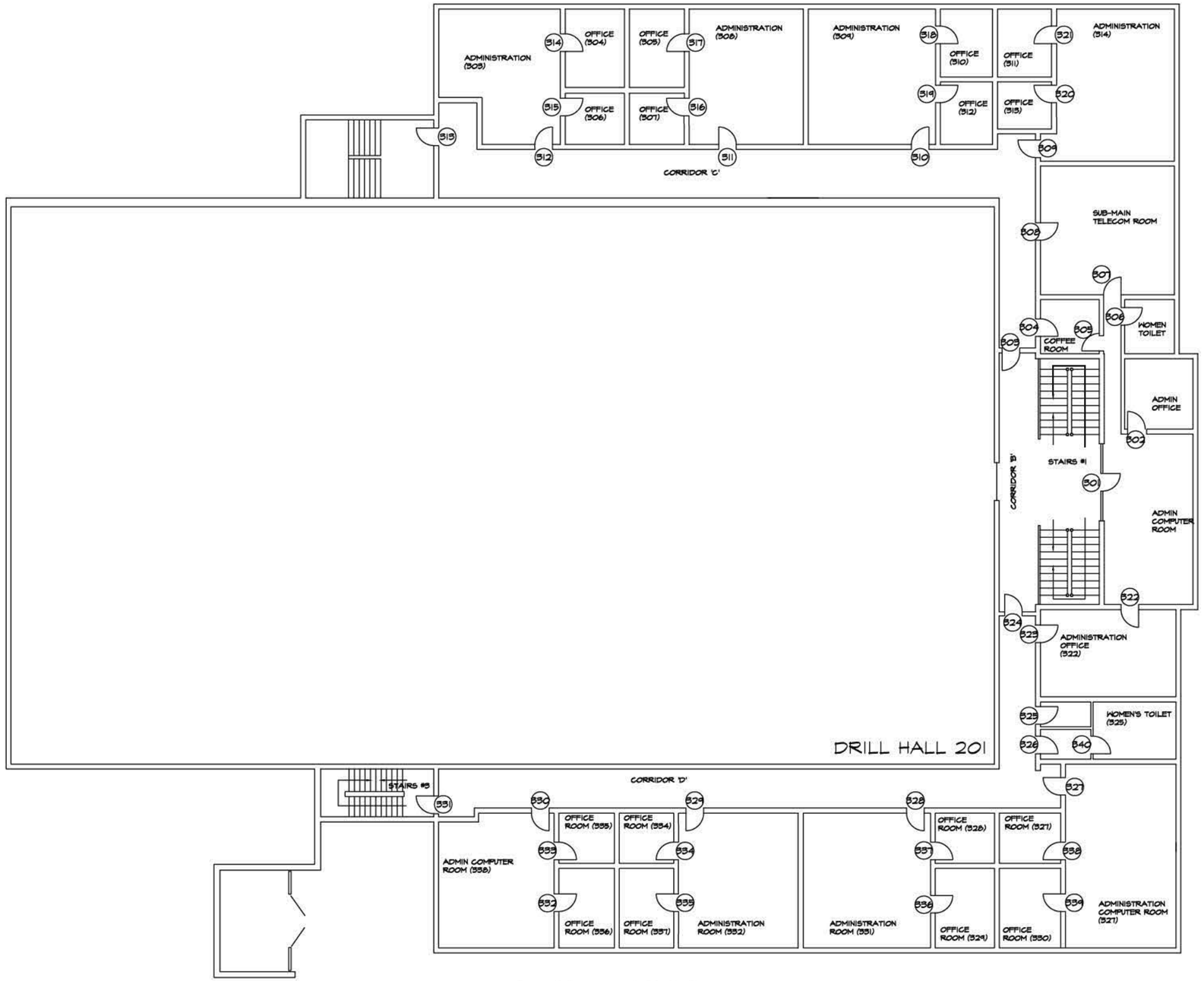
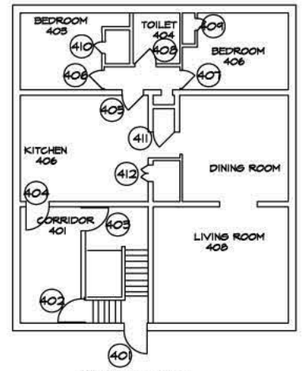


THIRD FLOOR LAYOUT



4TH FLOOR

DRAWN BY: XX
\\Ct-09050-fmo\DFM\Installations\WA - Waterbury (1350)\Buildings Information\WA - Building 001 Armory\Base Plans\ WA 001 03 and 04.dwg Jan 24, 2007 - 10:04am

THIRD AND FOURTH FLOOR

WA- WATERBURY ARMORY
CONNECTICUT ARMY NATIONAL GUARD

WATERBURY, CONNECTICUT

24 JAN 2007
0' X'

STATE OF CONNECTICUT
MILITARY DEPARTMENT
Facilities Management Office
360 Broad Street Hartford, CT 06103
860.493.2725 Fax 860.524.4937

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Appendix B
Certificates of Analysis

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Waterbury RC	**Chain Of Custody:**	513864
Address:	301-JH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Waterbury, CT	**Date Submitted:**	9/6/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/11/2012 **Report Date:** 9/11/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
12091630	WTBY-Bulk-02	Flame	Paint Chip	****	N/A	0.0077	%Pb		0.017	%Pb	
12091631	WTBY-Bulk-03	Flame	Paint Chip	****	N/A	0.0063	%Pb		0.0074	%Pb	
12091632	WTBY-Bulk-04	Flame	Paint Chip	****	N/A	0.011	%Pb		<0.011	%Pb	
12091633	WTBY-W01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091634	WTBY-W02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091635	WTBY-W03	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091636	WTBY-W04	Flame	Wipe	****	0.108	110	ug/ft^2	20	190	ug/ft^2	
12091637	WTBY-W05	Flame	Wipe	****	0.108	110	ug/ft^2	57	530	ug/ft^2	
12091638	WTBY-W06	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091639	WTBY-W07	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091640	WTBY-W08	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091641	WTBY-W09	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091642	WTBY-W10	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091643	WTBY-W11	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091644	WTBY-W12	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091645	WTBY-W13	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091646	WTBY-W14	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12091647	WTBY-W15	Flame	Wipe	****	0.108	110	ug/ft^2	29	270	ug/ft^2	
12091648	WTBY-W16	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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FOIA Requested Record #J-15-0085 (CT)
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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Waterbury RC	**Chain Of Custody:**	513864
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Waterbury, CT	**Date Submitted:**	9/6/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/11/2012
Attention:	Non-Responsive			**Report Date:**	9/11/2012

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
12091649	WTBY-W17	Flame	Wipe	****	0.108	110	ug/ft²	15	140	ug/ft²	
12091650	WTBY-W18	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12091651	WTBY-W19	Flame	Wipe	****	0.108	110	ug/ft²	19	180	ug/ft²	
12091652	WTBY-W20	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Analyst: Non-Responsive

Technical Manager: Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Waterbury RC	**Chain Of Custody:**	513864
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Waterbury, CT	**Date Analyzed:**	9/11/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12091653	WTBY-Bulk-01	NAD	--	--	--	--	--	--	--	--	--	100	MS	Yellow	Homogeneous	LBP	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Director: Non-Responsive **Analyst(s):** Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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FOIA Requested Record #J-15-0085 (CT)
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AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 513864

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: Waterbury RC
2. Job Location: Waterbury, CT
3. Job #: J12-676 PO #: W912K6-09-A-0003
4. Contact Person: Non-Responsive @phone # (410) 942-0273
5. Submitted By: Non-Responsive Signature: Non-Responsive

Reporting Information (Results will be provided

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☒ 5 Day + Date Due: 9/13/12
☐ 2 Day ☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC Page in Report
☒ Non-Responsive ariaenviro.com
☐ s.army.mil
☐ s.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)

PLM Bulk
☒ EPA 600 – Visual Estimate 1 (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)

MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)

TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
☐ Pb Paint Chip 3 (QTY)
☐ Pb Dust Wipe (wipe type 10x10cm 20 (QTY)
☐ Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media:
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WATER AND OTHER LIQUIDS	SPORE TRAP	TAPE	SWAB
See attached Sheets																

CLIENT CONTACT
(LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 9/16/12 @1445 Via: FEDEX By (
2. Date/Time Analyzed: 9/13/12 @17:15 LOM
3. Results Reported Non-Responsive Via: Email
4. Comments: 746 9122 013 COPY

Non-Responsive

Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 8/30/12

Job Site: Waterbury RC

Project No.: J12-676

Inspector: [redacted] Non-Responsive

Sample No.	Sample Type	Sample Location	Dimensions (Area)
WTBY-W01	Lead	3rd Floor Kitchenette floor	10x10cm
W02		3rd Floor Office near Kitchenette window sill	"
W03		3rd Floor Stairway window sill (dusty)	"
W04		Locker room #1 window sill (dusty)	"
W05		Locker room #2 floor (unfinished concrete)	"
W06		Office Suite (Empty) window sill	"
W07		Classroom (Row of desks) desk	"
W08		Classroom (short desks) floor (VCT)	"
W09		Mess Hall - window sill	"
W10		Mess Hall - Serving Counter	"
W11		Mess Hall - floor	"
W12		Drill Hall - counter & floor	
W13		Drill Hall - floor left of main entrance	
W14		Drill Hall - floor near ext. doors	
W15		Drill Hall - floor right of ~~front~~ bay door	
W16		Drill Hall - floor right of main entrance under basketball hoop	
W17		Former IFR Storage #1 floor painted concrete	
W18		Former IFR Storage #2 floor (food stuff)	"
W19		Former IFR Storage #3 floor	"
WTBY-Bulk-01	(asb)	cove base mastic on DO paper	~1 lf damaged
W20	Lead dust	Fitness Ctr Window sill	
WTBY-bulk-02	(Lead)	Peeling paint in Boiler Room	
WTBY-bulk-03	(Lead)	Paint in Cast Closet #129	
WTBY-bulk-04	(Lead)	Paint from floor near kitchen + Mess Hall	

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Login Sheet

Client:	National Guard Bureau	**Job Name:**	Waterbury RC	**Chain of Custody:**	513864
		Job Location:	Waterbury, CT	**Date Submitted:**	9/6/2012
		Job Number:	J12-676		

10-Sep-12

AMA Sample Number	Client Sample Number	Analysis Type(s) and Sample Type(s)
12091630	WTBY-Bulk-02	AA Lead Paint
12091631	WTBY-Bulk-03	AA Lead Paint
12091632	WTBY-Bulk-04	AA Lead Paint
12091633	WTBY-W01	AA Lead Wipe
12091634	WTBY-W02	AA Lead Wipe
12091635	WTBY-W03	AA Lead Wipe
12091636	WTBY-W04	AA Lead Wipe
12091637	WTBY-W05	AA Lead Wipe
12091638	WTBY-W06	AA Lead Wipe
12091639	WTBY-W07	AA Lead Wipe
12091640	WTBY-W08	AA Lead Wipe
12091641	WTBY-W09	AA Lead Wipe
12091642	WTBY-W10	AA Lead Wipe
12091643	WTBY-W11	AA Lead Wipe
12091644	WTBY-W12	AA Lead Wipe
12091645	WTBY-W13	AA Lead Wipe
12091646	WTBY-W14	AA Lead Wipe
12091647	WTBY-W15	AA Lead Wipe
12091648	WTBY-W16	AA Lead Wipe
12091649	WTBY-W17	AA Lead Wipe
12091650	WTBY-W18	AA Lead Wipe
12091651	WTBY-W19	AA Lead Wipe
12091652	WTBY-W20	AA Lead Wipe
12091653	WTBY-Bulk-01	PLM EPA 93

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Appendix C
Photo Documentation

FOIA Requested Record #J-15-0085 (CT)
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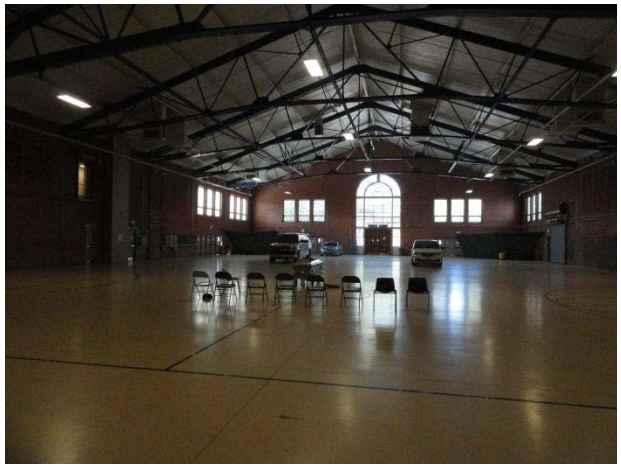
Waterbury, CT Readiness Center



Drill Hall

Drill Hall

Drill Hall

Office

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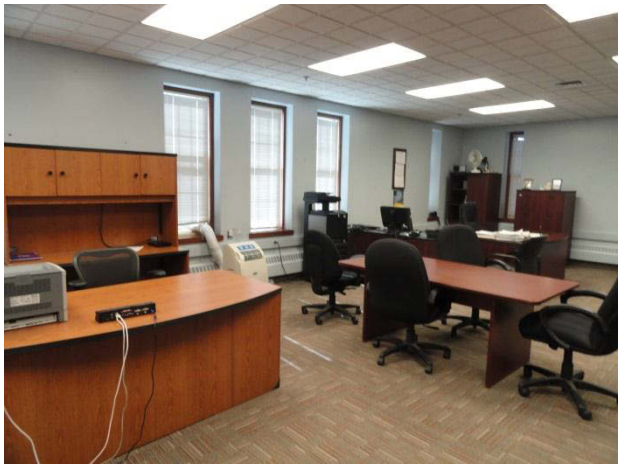
Waterbury, CT Readiness Center

Stained Ceiling Tile

Office



Office

Portable Air Conditioner

FOIA Requested Record #J-15-0085 (CT)
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Waterbury, CT Readiness Center

Custodian Closet

Conference Room

Conference Room

Break Room

FOIA Requested Record #J-15-0085 (CT)
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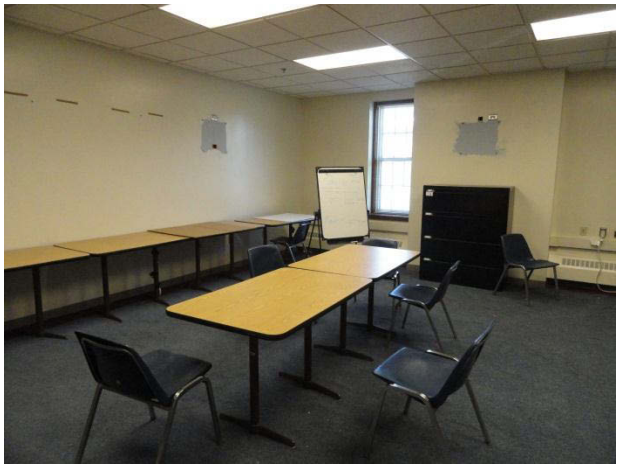
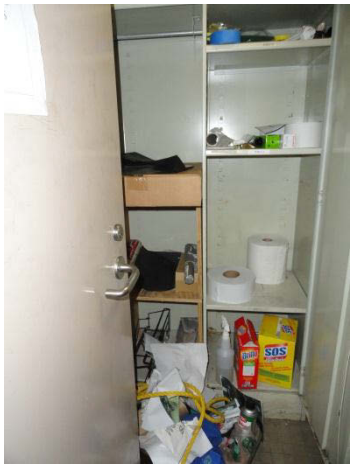
Waterbury, CT Readiness Center

Conference Room



Training Room

Office



Custodian Closet

FOIA Requested Record #J-15-0085 (CT)
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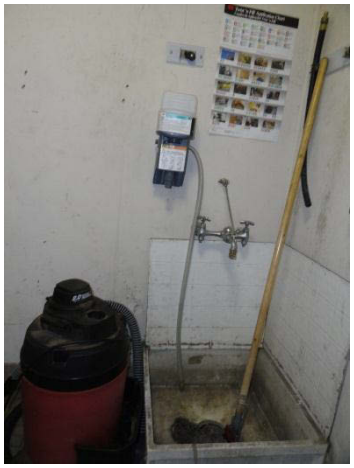
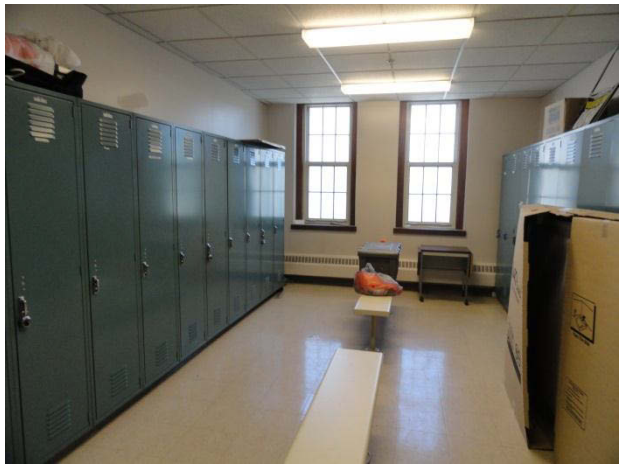
Waterbury, CT Readiness Center



Custodian Closet

MSDSs

Conference Room



Locker Room

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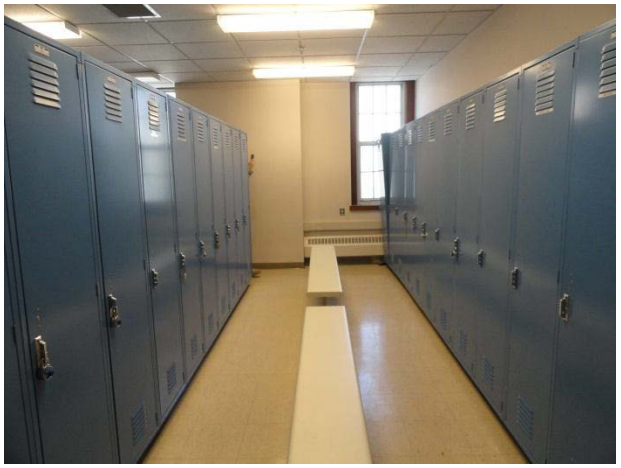
Waterbury, CT Readiness Center

Dust on Window Sill



Locker Room

Bathroom

Classroom

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Waterbury, CT Readiness Center

Stained Ceiling Tiles

Storage Room and Former Range

Kitchen

Storage Room and Former Range

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Waterbury, CT Readiness Center

Boiler Room

Peeling Paint in Boiler Room

Peeling Paint and Moisture Problem in Custodian Closet #129

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Appendix D
IAQ and Lighting Survey Log Sheets

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	Waterbury	IAQ								Light		
Date	8/30/2012	Inspecto	Non-Responsive [redacted]	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296						Serial Number		3021
Weather Conditions				Last Calibration		Mar-12						Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
4th Floor Office Suite		7	9:49	79.4		41.6		1,287	X	0.8		27-109	X	30-50
Back Office with A/C		2	9:50	77.0		36.1		1,163	X	0.8		30-123		30-50
Back Office without A/C		3	9:54	76.7		41.9		1,194	X	1.0		50-60		30-50
Bathroom 4th Floor		1	9:55									25		5
Bigger Office with 2 A/C's		6		77.1		41.2		1,391	X	0.7		30-70		30-50
3rd Floor Office Suite 1		4		78.1		42.0		488		0.6		42-142		30-50
3rd Floor Office Suite 2		4		78.5		42.6		488		0.6		36-155		30-50
3rd Floor Office Suite 3			10:03	77.9		38.9		507		0.7		27-190		30-50
3rd Floor Hallway 1		3	10:05	78.3		42.5		539		0.6		3-143	X	5
Plans/OPS Branch Office		3	10:05	78.1		37.9		572		0.5		93-163		30-50
325 Janitor's Closet		1	10:15									2-7	X	30
Major Connelly's Office		4	10:16	80.8	X	38.3		476		0.2		63-120		30-50
Conference Room 3rd Floor		4	10:18	82.5	X	38.5		479		0.6		55-72		30-50
Kitchenette		3	10:19	83.4	X	37.6		617		0.9		38-150		10
3rd Floor Hallway 2		3	10:26	81.3	X	36.9		579		0.5		1-112	X	5
Office Suite near Kitchenette		3	10:26	81.2	X	36.5		460		0.7		85-228		30-50
Recruiting Office		6	10:27	77.6		33.3		599		0.4		42-153		30-50
Small Classroom		4	10:28	77.3		40.5		455		0.4		72-170		30-50
130th PA Det. Office Suite		7	10:34	76.0		39.6		623		0.4		4-194	X	30-50
CSSB Office Suite		4	10:34	73.2		38.4		472		0.2		19-132	X	30-50
Stairway 3rd to 2nd		3	10:35									14-61		5

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	Waterbury	IAQ								Light		
Date	8/30/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296						Serial Number		3021
Weather Conditions				Last Calibration		Mar-12						Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
2nd Floor Hallway 1		3	10:36	76.9		43.8		450		0.1		6-113		5
2nd Floor Janitor's Closet		1	10:37									21-99	X	30
Office Suite (143 CSSB)		1	10:38	79.2		41.0		434		0.3		7-120	X	30-50
Locker Room 1		5	10:54	79.6		45.2		455		0.4		17-94		7
Locker Room 2		5	10:55	79.6		45.8		452		0.3		17-103		7
Selective Service		5	10:58	79.7		40.5		433		0.3		11-98	X	30-50
Office Suite by Locker Rm			11:08	78.9		40.7		441		0.4		12-86	X	30-50
Empty Office			11:10	79.6		40.2		458		0.1		11-173	X	30-50
Family Readiness Office			11:11	80.4	X	38.3		526		0.4		77-222		
Female Bathroom			11:11									25-137		5
Men's Locker Room 3			11:19									10-140		7
Classroom (sunken desks)			11:20	80.2	X	36.8		474		0.2		28-195	X	30-50
Classroom (short desks)			11:22	79.9		36.7		485		0.3		39-153		30-50
221 Classroom Simulator			11:27	79.4		37.7		439		0.2		18-131	X	30-50
Drill Hall			11:54	77.9		40.5		484		0.7		6-42	X	50
1st Floor Mess Hall		3	11:50	79.9		39.3		435		0.4		57-144		30
Foyer and Stairs		5	11:57	78.0		44.2		631		0.3		7-6		5
Former Range/Storage 1		4	12:10	77.5		45.7		565		0.3		6.5-53	X	30
Former Range/Storage 2		4	12:11	76.8		46.6		492		0.2		9-55	X	30
Kitchen		4	12:17	78.0		42.5		417		0.0		2-110	X	50
Former Range/Storage 3		4	12:20	78.4		43.0		440		0.1		1-99	X	30

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	Waterbury	IAQ								Light		
Date	8/30/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296						Serial Number		3021
Weather Conditions				Last Calibration		Mar-12						Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Storage Room		4	12:23									18-43	X	30
Boiler Room		4	12:25	77.8		40.9		409		0.1		7-64	X	30
Storage Garage		4	12:31	78.2		41.5		441		0.2		7-9	X	30
Shower Room 139		3	12:32									20-85		
Fitness Center		4	12:35	79.3		41.3		436		0.3		9-44	X	30
Room 129		2	12:38									3-25	X	30
Outside			13:27	81.1		33.9		397		0.3				

FOIA Requested Record #J-15-0085 (CT)
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URS

Prepared For:

National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301 – IH Old Bay Lane
Havre De Grace, Maryland 21078

Prepared By:

URS Corporation
5 Industrial Way
Salem, New Hampshire 03079

FINAL
INDUSTRIAL HYGIENE SURVEY REPORT
WESTBROOK ARMORY
WESTBROOK, CONNECTICUT

July 2006
PN: 39741509

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1018 of 1092

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TABLE OF CONTENTS

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1019 of 1092

BEST AVAILABLE COPY

TABLE OF CONTENTS (Cont)

Section **Page**

APPENDICES

BEST AVAILABLE COPY

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1020 of 1092

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FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Ergonomic		
Computer workstations were observed with chair with fixed armrests and keyboards.	Ergonomic issues with the desks and chairs should be corrected by fitting the workplace to the worker (Department of the Army Pamphlet 40-21, Chapter 4, Page 7, Section 4-3)	RAC 3
Indoor Air Quality		
On the day of the survey relative humidity levels exceeded the recommended maximum level of 65%. Relative humidity above 65% makes for an uncomfortable work environment. Prolong relative humidity can create a favorable environment for mold growth.	Maintain relative humidity levels below 65% through use of dehumidifiers or window air-conditioning units (ASHRAE 62.1-2004)	RAC 3
Lead		
Lead was detected in wipe samples collected from the facility in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the former firing range where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025 (e)(1)(i))	RAC 2
Asbestos		
Damaged asbestos containing pipe insulation was observed in the drill hall.	Remove and replace damaged asbestos-containing materials. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 2
A site-specific asbestos operations and maintenance plan was available. No warning labels were posted in janitorial or maintenance areas.	Maintain a site specific asbestos operations and maintenance plan to manage asbestos-containing materials by labeling of asbestos (OSHA 29 CFR 1910.1001 (j)(4))	RAC 3
Hazard Communication		
A site specific hazard communication plan was not available.	Implement the site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1021 of 1092

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1.0 SUMMARY

At the request of the National Guard Bureau (NGB) Region North Industrial Hygiene Office, URS Corporation (URS) conducted an industrial hygiene survey at the Westbrook Armory located at 37 Brookside Avenue in Westbrook, Connecticut 06498. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On August 5, 2005, Ms Non-Responsive, an industrial hygienist with URS, conducted a site visit at the Armory in Westbrook, Connecticut. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, lighting measurements, and a review of site health and safety procedures. Lt. Non-Responsive of the Connecticut ARNG was Ms. Non-Responsive site contact for this survey.

This armory is a single story brick building, with an attached drill hall that is constructed primarily of brick and mortar. This facility is built on a concrete slab and has a flat asphalt roof. A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A. The risk assessment codes associated with this project are contained in Table 1.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1022 of 1092

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2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building with desks and computer workstations. Computer workstations were assessed during the walkthrough for ergonomic issues. Some computer workstations had chairs where the armrests were in a fixed position. If more than one person is using that station, then proper adjustments need to be made to accommodate each person. No complaints were received by URS concerning workstations at the time of this survey.

2.2 Chemical and Physical Agents Sampled

On the day of the survey, relative humidity, carbon dioxide and carbon monoxide measurements were made in the drill hall, the orderly room, and outside. These readings were all made using a TSI Q-Trak ™ (Model 8551). No indoor air quality complaints were received during this survey.

2.2.1 Relative Humidity

Relative humidity on the day of the survey ranged from 68.5-68.8 % throughout the various building areas with an average of 68.65%. The average reading was above the recommended maximum level of 65% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 62.1-2004). During the site visit, the windows to the facility were open to accommodate the comfort levels of the two employees working in the facility. The outside humidity reading was 67.8%.

2.2.2 Carbon Dioxide

Carbon dioxide concentrations ranged from 508 to 521 parts per million (ppm), with an average of 514.5 ppm. The outside reading was 420 ppm.

Carbon dioxide is a normal constituent of the atmosphere and ranges from about 250 to 450 ppm. The major source of excess carbon dioxide in the indoor environment is

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1023 of 1092

people. Other sources can include open-flame heaters, fermentation processes, and motor vehicles. Carbon dioxide itself is not normally a cause of indoor air quality problems because concentrations must exceed 5,000 to 10,000 ppm before health effects such as headache, drowsiness, and increased respiration are noted. Typically, carbon dioxide is used as an indicator of the adequacy of fresh air intake. As the concentration of carbon dioxide increases, so do the background levels of other air contaminants.

ASHRAE (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 420 ppm on the day of the survey, the ASHRAE limit would be 1,120 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations were measured at 3.0 ppm on the day of the survey. ASHRAE (62.1-2004) recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm. The measured levels were below the ASHRAE guideline for indoor environments (62.1-2004). Carbon monoxide was measured using a TSI Q-Track (Model 8551).

Key sources of carbon monoxide within indoor environments may include internal combustion engines, motor vehicle and forklift exhaust, tobacco smoke, space heaters, and improperly adjusted oil or gas burners. Health effects from exposure to elevated concentrations of carbon monoxide may include fatigue, impairment of visual acuity, irregular heartbeat, headache, nausea, and confusion.

2.2.4 Lighting

Lighting in the administrative areas was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 2-1 below shows lighting measurements and the recommended lighting requirement (ANSI/IESNA RP–1-04 American National Standard Practice for Office Lighting).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1024 of 1092

Table 2-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Lighting (foot candles)	Recommended Lighting (foot candles)
CO Office	Administrative Duties	100	50
Vacant Office @ CO Office	Administrative Duties	239	50
1 Sgt Office	Administrative Duties	23	50
Orderly Room	Administrative Duties	67	50

2.2.5 Lead

Wipe testing for lead was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA Analytical Services, Inc. (AMA) is contained in Appendix D. Table 2-2 below shows the results of the lead sampling.

Table 2-2
Levels of Lead Dust Found in the Administrative Area

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Kitchen-Soap Dispenser	RWS-1	16 in^2	3.4	200
Entrance-Floor	RWS-2	16 in^2	10	200
Platoon Room-Window Sill	RWS-3	16 in^2	25	200

Sample numbers and locations can be found on the site map in appendix A.

2.3 Ventilation System Evaluation

Not applicable to this operation.

2.4 Noise Measurements

Not applicable to this operation.

2.5 Personal Protective Equipment

Not applicable to this operation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1025 of 1092

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2.6 Interpretation of Results

GENERAL: In general, the administrative area was neat and orderly. The fire exits and extinguishers were marked and easily accessible.

ERGONOMICS: The observed ergonomic issues were minor with the chairs and keyboards and should be corrected by fitting the workplace to the workers.

INDOOR AIR QUALITY: On the day of the survey relative humidity levels exceeded the recommended maximum level of 65%. Relative humidity above 65% makes for an uncomfortable work environment. Prolonged relative humidity can create a favorable environment for mold growth.

LIGHTING: On the day of the survey the illumination in the administrative area was adequate in all measured offices. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: All dust wipe samples collected from the administrative area were determined to contain lead at a level below 200 micrograms/ square foot. This is the level recommended by the region north Industrial Hygiene office (Appendix G).

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1026 of 1092

3.0 FORMER INDOOR FIRING RANGE

3.1 Operation Description

The indoor firing range has been dismantled and this building area is now primarily used for storage and a locker room.

3.2 Chemical and Physical Agents Sampled

3.2.1 Lead

Wipe testing for lead was conducted in the former firing range using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 3-1 below shows the results of the lead sampling.

Table 3-1
Levels of Lead Dust Found in the Former Firing Range

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Indoor Firing Range-Safe	FR-01	16 in^2	20	200
Indoor Firing Range-Floor	FR-02	16 in^2	29	200
Indoor Firing Range-Cabinet	FR-03	16 in^2	84	200
Indoor Firing Range-Shelf(Common Room)	FR-04	16 in^2	200	200
Indoor Firing Range-Locker	FR-05	16 in^2	100	200

Sample numbers and locations can be found on the site map in appendix A.

One air sample for lead dust was also collected in the former firing range. Table 3-2 below shows the result of this air sample.

Table 3-2
Airborne Concentration of Lead Dust

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	Lead Action Level ($\mu g/m^3$)
Indoor Firing Range	AIR-01	146	<21	30.0

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1027 of 1092

BEST AVAILABLE COPY

Sample numbers and locations can be found on the site map in Appendix A.

On the day of the survey, the airborne lead dust level in the former indoor firing range was found to be below the OSHA action level of 30.0 $\mu g/m^3$ averaged over an 8-hour day.

3.3 Ventilation System Evaluation

Not applicable to this operation.

3.4 Noise Measurements

Not applicable to this operation.

3.5 Personal Protective Equipment

Not applicable to this operation.

3.6 Interpretation of Results

LEAD: One surface tested for lead in the former firing range was found to contain lead at 200 micrograms per square foot (See Appendix G). The U.S. Occupational Safety and Health Administration (OSHA) regulations, 29 CFR 1910.1025 and 29 CFR 1926.62 are designed to protect workers potentially exposed to elevated airborne levels of lead. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G. Recommendations for the clean-up and rehabilitation of indoor firing ranges is provided in Appendix H.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1028 of 1092

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 6,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of cinder blocks with a wood floor.

4.2 Chemical and Physical Agents Sampled

4.2.1 Lead

Wipe testing for lead dust was conducted in the drill hall using Ghost Wipes™, which meet ASTM E 1792 standards. The analytical report from AMA is contained in Appendix D. Table 4-1 below shows the results of the lead sampling.

Table 4-1
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Drill Hall-Window Crank	DH-06	16 in^2	280	200
Drill Hall-Vehicle Box	DH-07	16 in^2	47	200
Drill Hall-Soda Machine	DH-08	16 in^2	8.5	200
Drill Hall-Floor	DH-09	16 in^2	12	200
Drill Hall-Table	DH-10	16 in^2	9.2	200

Sample numbers and locations can be found on the site map in Appendix A.

4.2.2 Asbestos

No bulk samples were collected from suspect asbestos-containing materials (ACM) by Ms. [redacted] during the survey. Damaged pipe insulation was observed during the site visit. According to site contact, Lt. [redacted] a contractor was scheduled to replace the pipe insulation.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1029 of 1092

BEST AVAILABLE COPY

4.3 Ventilation System Evaluation

Not applicable to this operation.

4.4 Noise Measurements

Not applicable to this operation.

4.5 Personal Protective Equipment

Not applicable to this operation.

4.6 Interpretation of Results

LEAD: One surface tested for lead in the drill hall was found to contain lead in excess of 200 micrograms per square foot (see Appendix G). The U.S. Occupational Safety and Health Administration (OSHA) regulations, 29 CFR 1910.1025 and 29 CFR 1926.62 are designed to protect workers potentially exposed to elevated airborne levels of lead from lead-based paint. The NGB Region North Industrial Hygiene Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1030 of 1092

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5.0 BOILER ROOM

5.1 Operation Description

The boiler room is a mechanical space constructed of cinder block walls with a concrete floor, containing a furnace and associated piping.

5.2 Chemical and Physical Agents Sampled

No chemical or physical agents were sampled in this area.

5.3 Ventilation System Evaluation

Not applicable to this operation.

5.4 Noise Measurements

Not applicable to this operation.

5.5 Personal Protective Equipment

Not applicable to this operation.

5.6 Interpretation of Results

Not applicable to this operation.

BEST AVAILABLE COPY
FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1031 of 1092

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6.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

6.1 Confined Spaces

No safety program was found regarding confined spaces. No training records were found on site. A confined spaces program is not required for this site.

6.2 Hearing Conservation

No safety program was found regarding hearing conservation. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

No safety program was found regarding respiratory protection. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

Though chemical inventory sheets and MSDS's were found on site, a site-specific program was not found regarding hazard communication. Training records were not found on site. A site-specific hazard communication program is required for this site and should include communication of hazards to employees, management of material safety data sheets, chemical labeling and spill protection.

6.5 Personal Protective Equipment

No safety program was found regarding personal protective equipment. No training records were found on site. A personal protective equipment program is not required for this site.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1032 of 1092

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7.0 REFERENCES

American National Standards Institute

ANSI/ESNA RP-1-04: American National Standard Practice for Office Lighting

American Society of Heating Refrigerating and Air-Conditioning Engineers

ANSI/ASHRAE Standard 62.1-2004: Ventilation for Acceptable Indoor Air Quality

Department of the Army

Ergonomics Program Pamphlet 40-21 (15 August 2003)

Policy and Responsibilities for Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges (National Guard Regulation 385-15, 30 December 2002)

Department of Defense

DoD Hearing Conservation Program Standard 6055.12 April 1996

Creating an Ideal Workstation: A Step-by-Step Guide

U. S. Environmental Protection Agency

Asbestos Hazard Emergency Response Act (40 CFR Part 763)

National Emissions Standards for Hazardous Pollutants (40 CFR Part 61)

U. S. Housing and Urban Development

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

BEST AVAILABLE COPY

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1033 of 1092

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APPENDIX A

ARMORY DRAWING

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WESTBROOK, CT ARMORY

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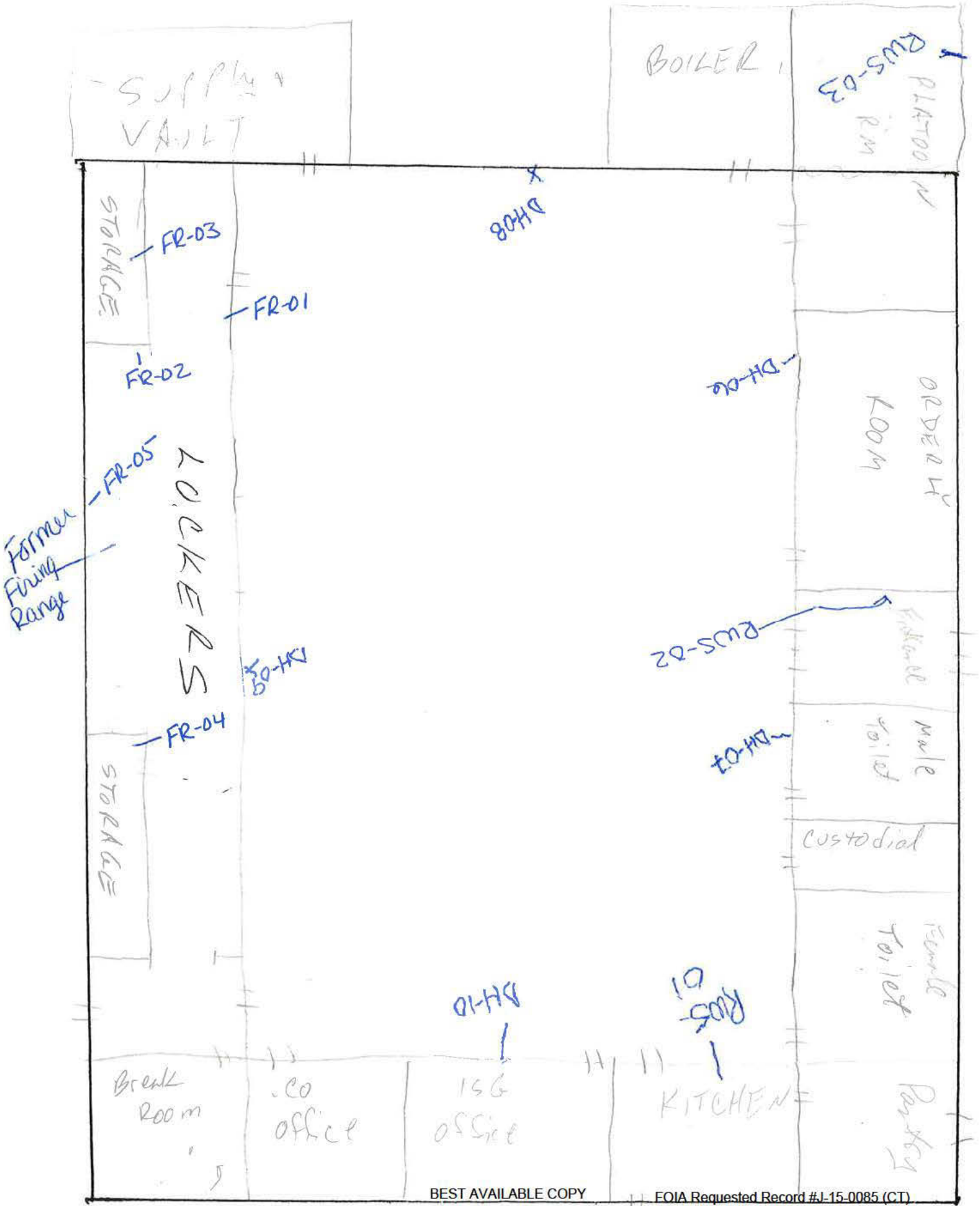

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1035 of 1092

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APPENDIX B

PERSONNEL LIST

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FOIA Requested Record #J-15-0085 (CT)
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PERSONEL LIST
WESTBROOK ARMORY

Name	Rank
Non-Responsive	SFC
	SSG
	SSG
	SGT

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APPENDIX C

HAZARDOUS MATERIALS LIST

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MSDS

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Shelve #1

Advance Pineall
Purpose Cleaner
8/1Gal.

Replay Neutral
Cleaner 3/1Gal.

Clearachrome
Metal Crosslinked
Finish 1/1Gal.

Shelve #2

Austin's Bleach
6/1Gal.

Luster Plus
No rinse neutral
Floor Cleaner
4/1Gal.

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Shelve #3

Bab-o Cleanser
With Bleach

GoJo Skin Cleanser

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APPENDIX D

ANALYTICAL RESULTS

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A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Westbrook Armory	**Chain Of Custody:**	141922		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Westbrook, CT	**Date Submitted:**	8/12/2005		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	Not Provided	**Date Analyzed:**	8/19/2005	**Report Date:**	19-Aug-05

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0559048	Air-01	Flame	Air	146	N/A	20.55	ug/m³	< 21	ug/m³	
0559049	FR-01	Furnace	Wipe	****	0.108	2.79	ug/ft²	20	ug/ft²	
0559050	FR-02	Furnace	Wipe	****	0.108	13.94	ug/ft²	29	ug/ft²	
0559051	FR-03	Furnace	Wipe	****	0.108	13.94	ug/ft²	84	ug/ft²	
0559052	FR-04	Furnace	Wipe	****	0.108	69.70	ug/ft²	200	ug/ft²	
0559053	FR-05	Furnace	Wipe	****	0.108	13.94	ug/ft²	100	ug/ft²	
0559054	DH-06	Furnace	Wipe	****	0.108	69.70	ug/ft²	280	ug/ft²	
0559055	DH-07	Furnace	Wipe	****	0.108	13.94	ug/ft²	47	ug/ft²	
0559056	DH-08	Furnace	Wipe	****	0.108	2.79	ug/ft²	8.5	ug/ft²	
0559057	DH-09	Furnace	Wipe	****	0.108	2.79	ug/ft²	12	ug/ft²	
0559058	DH-10	Furnace	Wipe	****	0.108	2.79	ug/ft²	9.2	ug/ft²	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Technical Manager: [redacted]

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP Accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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11/09/2005 AEROSOL MONITORING & ANALYSIS → 16038936240 NO.481 P06

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0
NY ELAP 10920
AIHA 100470

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	145335
Address:	301-H Old Bay Lane, Attn: NGB-AVN-SL, State Military Reservation	**Job Location:**	Armory	**Date Submitted:**	10/21/2005
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	11/9/2005
Attention:	[redacted]			**Report Date:**	09-Nov-05

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Final Result	Comments
0604311	RWS-01	Furnace	Wipe	****	0.108	2.79 ug/ft^2	3.4 ug/ft^2	
0604312	RWS-02	Furnace	Wipe	****	0.108	2.79 ug/ft^2	10 ug/ft^2	
0604313	RWS-03	Furnace	Wipe	****	0.108	2.79 ug/ft^2	25 ug/ft^2	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Analyst: [redacted] **Technical Manag**[redacted]

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APPENDIX E

TRAINING CERTIFICATES

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May-26-05 01:17pm From-URS CORPORATION BEST AVAILABLE COPY T-317 P.02/02 F-076

CERTIFICATE OF ACHIEVEMENT

This certifies that

[redacted] Non-Responsive

has successfully completed the

Asbestos Site Inspector Refresher Training
Asbestos Accreditation Under TSCA Title II
40 CFR Part 763

conducted by

ATC Associates Inc.
73 William Franks Drive
West Springfield, MA 01089
(413) 781-0070

[redacted] Non-Responsive
Principal Instructor

May 26, 2005
Date of Course

May 26, 2006
Expiration Date

[redacted] Non-Responsive
Regional Manager

SIAR-1938
Certificate Number

May 26, 2005
Examination Date

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Page 1045 of 1092

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APPENDIX F

PHOTOGRAPHS

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Photo 1:
Drill Hall-Layout

Photo 2:
Drill Hall-ACM Pipe Insulation

Photo 3:
Orderly Room-Unadjustable Chair

Photo 4:
Custodian Closet-Chemical Storage

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Photo 5:
Area O/S Storage-Flammable Cabinet With Inventory Sheet

Photo 6:
Platoon Room-ACM 9" x 9" Tiles in Good Condition

Photo 7:
Former Firing Range-Layout

Photo 8:
Drill Hall-MSDS's

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Page 1048 of 1092

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APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

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2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

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APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES (NATIONAL GUARD REGULATION 385-15, 30 DECEMBER 2002)

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

ADDENDUM

GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING

CONTENTS (Listed by paragraph number)

Purpose
1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

2. References
Related publications are listed below.
a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
b. AR 11-34 (The Army Respiratory Protection Program).
c. AR 40-5 (Preventive Medicine).
d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
f. OSHA Technical Manual, Edition VII.
g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

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Page 1053 of 1092

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3. Explanation of Abbreviations and Terms
Abbreviations and special terms used in this publication are listed in the glossary.

4. Policy and Procedures
Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following --

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.

b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5th Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/Items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

5. Goal
To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

6. Background
The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of --

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman ™ #40 paper.

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Page 1054 of 1092

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(2) Unacceptable Media consists of but is not limited to—
(a) Cotton balls
(b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

8. Wipe Sampling Protocol
See Appendix A.

9. Ranges Cleaning Instructions

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequency. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

10. Cleaning Stored Contaminated Equipment

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1055 of 1092

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b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porus, non-porus, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

11. Contaminated Sand and Lead Waste
Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

12. Medical Surveillance

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements. A medical examination must include—

(1) A detailed work and medical history
(2) A thorough physical examination
(3) A respirator use evaluation
(4) A blood pressure measurement
(5) Blood sample analysis to include:
  (a) A baseline blood lead level
  (b) A complete blood count (CBC)
  (c) Blood urea nitrogen (BUN)
(6) Serum creatinine
(7) Zinc protoporphyrin
(8) A routine urine analysis
(9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

13. Worker Education
OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be Instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

a. The content of the standard and its appendices.
b. The specific nature of operations that could result in exposure to lead above the action level.
c. The purpose, proper selection, fitting, use and limitations of respirators.
d. The purpose and a description of medical surveillance program.
e. Eating and drinking are prohibited in lead contaminated areas.
f. Smoking and smoking materials will not be permitted in contaminated areas.

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Page 1056 of 1092

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g. Employees must wash their hands and other exposed skin whenever they leave the work area.
h. The engineering controls and work practices associated with the individual's job assignment.
i. The contents of any compliance plan in effect.

14. Personal Protective Equipment
For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(1) Protective coveralls with hood and shoe covers or disposable Tyvek ™ full body suit.
(2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
(3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

15. Housekeeping
This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

16. Maintenance
The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

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Released by National Guard Bureau
Page 1057 of 1092

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b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.

c. Inspect Louvers, if applicable, to ensure they are opening fully.

d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

f. The range ventilation system will be operational during all bullet trap cleaning procedures.

g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.

h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

17. Range Rehabilitation.

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.

b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.

c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

a. All ranges slated for conversion will be inspected and evaluated.

b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.

c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.

d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.

e. Light fixtures and ventilation system grills must be removed and decontaminated.

f. Ventilation system ducts need to be decontaminated or removed and replaced.

g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.

h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

19. Deviation

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1058 of 1092

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APPENDIX A
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

APPENDIX B
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

APPENDIX C
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)

C-1 200 micrograms/sq ft or LESS
If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft
Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft
Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

BEST AVAILABLE COPY

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1059 of 1092

BEST AVAILABLE COPY

APPENDIX C (Continued)

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

APPENDIX D

INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)

D-1 200 micrograms/sq. ft or less
If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

APPENDIX E

RECOMMENDED SAMPLE MEDIA AND CONTAINERS

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

Order From	Catalog Number
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco. Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1060 of 1092

APPENDIX E (Continued)

800-247-6628
800-359-3041

b. Millipore Corp. AAWP-037-00
Ashdy Road
Bedford, MA 01730
617-275-9200
800-225-1380

c. SKC, Inc. 225-5
334 Valley View Rd.
Eighty Four, PA 15330
412-941-9701
800-752-8472

[redacted]

E-5. Glass container (25 milliliter) for collection and shipment of media.

Order From Catalog Number

a. Pierce Chemical Co. 13219 (screw cap)
P.O. Box 117
Rockford, IL 61105
815-968-0747
800-874-3723

b. Alltech Associates, Inc. 95321 (screw cap)
Applied Science Labs
2051 Waukegan Rd.
Deerfield, IL 60015
312-948-8600

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1061 of 1092

BEST AVAILABLE COPY

APPENDIX E (Continued)

800-255-8324

E-6. Ghost Wipes™.

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC4200

E-7. Ghost Wipe™ Containers

Order From	Catalog Number
Environmental Express 490 Wando Park Blvd. Mt. Pleasant, SC 29464 1-800-343-5319	SC499

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately $1.25. Deionized water can be obtained at local and state water labs or a hospital.

APPENDIX F
EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1062 of 1092

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX G
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet			
Return Address		Point of Contact *(name & phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation		Date Collected	Date Shipped
Analysis Desired			
Sampling Data			

Lab Use Only	Sample #	Results	Remarks

Comments to Lab:

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1063 of 1092

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NGB-AVS-SG
SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

APPENDIX H
AIR SAMPLING SHEET

Industrial Hygiene Air Sample Sheet

Return Address		Point of Contact *(name/phone #)*	
		Samples Collected By	
Sampled Facility	City	State	Location *(bldg/area)*
Description of Operation	___ Persons Exposed	___ Hrs/Day	Method of Collection
Analysis Desired			

Sampling Data

Sample No.								
Pump No.								B
Time On								L
Time Off								A
Total Time (min)								N
Flow Rate (LPM)								K
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								

Calibration Information

Pump No.	Calibration (LPM)		Rotameter Setting	Date
	Pre-Use	Post-Use		

Name of Calibrator	Calibration Date	Pump Manufacturer
Comments to Lab:		

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1064 of 1092

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APPENDIX I
ABBREVIATIONS AND TERMS

Section I
Abbreviations

ARNG
Army National Guard

BUN
Blood urea nitrogen

BZ
Breathing zone

CBC
Complete blood count

CFR
Code of Federal Regulations

cm
Centimeter

DHEW
Department of Health, Education and Welfare

EPA
Environmental Protection Agency

GA
General area

OMPF
Official Military Personnel File

OPF
Official Personnel File

OSHA
Occupational Safety and Health Administration

TCLP
Toxic Characteristic Leaching Procedures

ug/sq ft
Micrograms per square foot

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1065 of 1092

BEST AVAILABLE COPY

APPENDIX I (Continued)

Section II
Terms

HEPA
Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

Lead-Contaminated Range
It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

Wipe Sample
The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.

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FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1066 of 1092

BEST AVAILABLE COPY

Industrial Hygiene Survey

Connecticut Army National Guard (CT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Westbrook Readiness Center
37 Brookside Avenue
Westbrook, CT 06498

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: August 22, 2012

AEI Project #: J12-676 3h CT Westbrook RC

_____

Non-Responsive, **CIH, CSP, LEED Green Associate**
Industrial Hygienist

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1067 of 1092

Table of Contents

List of Tables and Appendices

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1068 of 1092

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) Westbrook Readiness Center located at 37 Brookside Avenue, Westbrook, CT 06498 Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 22, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed near the ledge of the high windows in the Drill Hall. A paint chip sample was collected and submitted for lead analysis. The paint chip sample was found to contain less than 0.5% lead by weight which is not considered lead-based paint. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged parquet flooring with black mastic and Drill Hall window caulk were observed, and bulk samples were collected. No asbestos was detected in either sample.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of mold growth was observed on the day of the inspection; however, water intrusion was observed coming from the high windows in the Drill Hall. Some windows could not be completely closed due to their age and allowed rain water to enter the building. Water stains and peeling paint were observed on a large portion of one wall.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable with room for improvement in some areas.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 6.5 foot candles (fc) to over 1,000 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly within the comfort ranges for the summer season on the day of the survey. The outdoor temperature and relative humidity were 80.2° F and 56.1% on the day of monitoring, and indoor conditions were similar to outdoor conditions. The facility has window air-conditioning units in some areas, but the majority of the building is not air-conditioned. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide were below the recommended concentrations in all areas except for one CO_2 concentration in an office with 6 occupants which had a concentration only slightly higher than the guideline (1,174 ppm).

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1069 of 1092

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available as per the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1200. MSDSs were readily available and up to date. It is recommended that the written hazard communication program be placed in every MSDS notebook along with any related training records.

Overall, the Westbrook Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1070 of 1092

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Connecticut Army National Guard (CTARNG) Westbrook Readiness Center located at 37 Brookside Avenue, Westbrook, CT 06498. Non-Responsive, CIH, CSP, LEED Green Associate performed the evaluation on August 22, 2012. The point of contact for the facility was the civilian maintainer, Non-Responsive The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Westbrook Readiness Center was built in the 1970's. The readiness center is staffed by 10 National Guard administrative personnel, 1 part time civilian caretaker (maintainer) and a civilian family readiness administrator. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Westbrook Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Westbrook facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state employed maintainer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1071 of 1092

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for damaged building materials that may contain asbestos or lead-based paint, for water damage or mold problems; for potential ergonomic problems; and for housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed near the ledge of the high windows in the Drill Hall. A paint chip sample was collected and submitted for lead analysis. Results are given in Table 1 and certificates of analysis are included in Appendix B. The paint on the window ledge was below 0.5% lead by weight and is not considered lead-based paint.

Table 1 – Results of Paint Chip Sampling for CTARNG Westbrook Readiness Center on August 22, 2012.

Sample #	Sample Location	Lead Result (% by wt)
West-Bulk01	Peeling paint near high windows in Drill Hall	<0.0066

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the state of Connecticut limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical Services, Inc. (AMA) of Lanham, MD for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Wipe samples collected from the facility were below the recommended maximum level for surface contamination in all areas sampled. Surfaces contaminated with lead dust should be cleaned using wet methods or high efficiency particulate air (HEPA)-filtered vacuums. Results are given in Table 2 and certificates of analysis are included in Appendix B.

Table 2 – Results of Dust Wipe Sampling for CTARNG Westbrook Readiness Center on August 22, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
West-W01	Drill Hall – high window sill	160
West-W02	Drill Hall – center of floor	<110
West-W03	Drill Hall – pipe run	120

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1072 of 1092

Table 2 – Results of Dust Wipe Sampling for CTARNG Westbrook Readiness Center on August 22, 2012.

Wipe Sample #	Sample Location	Lead Result (µg/ft^2)*
West-W04	Drill Hall – floor under leaky windows	<110
West-W05	Drill Hall – serving counter	<110
West-W06	Kitchen – prep table	<110
West-W07	Locker Room – Former Firing Range – painted floor	<110
West-W08	Locker Room – Former Firing Range – painted floor	<110
West-W09	Locker Room – Former Firing Range – painted floor	<110
West-W10	Former firing range – back lobby – floor	<110
West-W11	Fitness Center	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft^2) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged parquet flooring with black mastic and Drill Hall window caulk were observed, and bulk samples were collected. Samples were submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. No asbestos was detected in the black mastic or the window caulk.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of mold growth was observed on the day of the inspection; however, water intrusion was observed coming from the high windows in the Drill Hall. Some windows could not be completely closed due to their age and allowed rain water to enter the building. Water stains and peeling paint were observed on a large portion of one wall.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable with room for improvement in some areas.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in one area due to bulbs being removed or blown out. The

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1073 of 1092

illumination measurements indoors ranged from 6.5 foot candles (fc) to over 1,000 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 3. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 3 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 71.7 to 81.8° F and 35.4 to 63.8% Rh. Temperature and relative humidity measurements were mostly acceptable compared to the comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 80.2° F and 56.1%, and conditions inside were similar to the outdoor conditions. This readiness center has window air-conditioning units in some areas but the majority of the building is not air-conditioned.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 388 to 1,174 parts per million (ppm). The outdoor CO_2 concentration was 384 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas except for one office that had six occupants at the time of monitoring and a CO_2 concentration of 1,174 ppm which is only slightly above the guideline.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking

FOIA Requested Record #J-15-0085 (CT)
Released by National Guard Bureau
Page 1074 of 1092

lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.0 to 0.5 ppm; therefore all measurements were below the concentrations of concern.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available per OSHA 29 CFR 1910.1200. MSDSs were readily available and up to date. It is recommended that the written hazard communication program be placed in every MSDS notebook along with any related training records.

7 Conclusions

The results of the evaluation indicated a few minor concerns at the facility. Overall, the Westbrook Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.

FOIA Requested Record #J-15-0085 (CT)
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Page 1075 of 1092

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5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

FOIA Requested Record #J-15-0085 (CT)
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Page 1076 of 1092

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Appendix A
Building Layout

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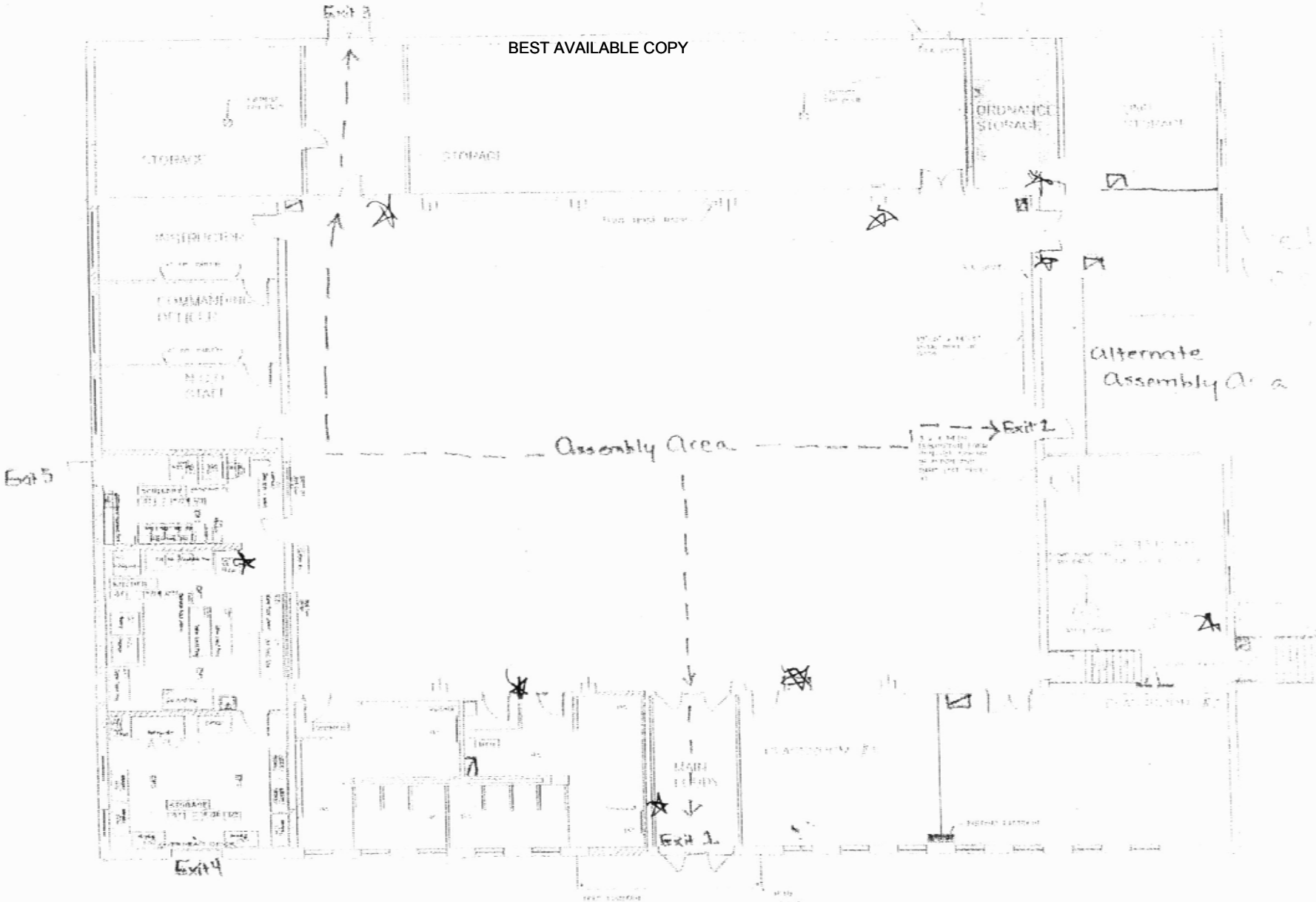

FIRST FLOOR

WESTBROOK ARMORY

SCALE: 1/8" = 1'0"

⊠ = fire extinguishers

Evacuation Assembly Points are North Parking Area and Compound

FOIA Requested Record #J-15-0085 (CT)
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Page 1078 of 1092

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Appendix B
Certificates of Analysis

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Westbrook RC	**Chain Of Custody:**	513788
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Westbrook, CT	**Date Submitted:**	8/30/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/6/2012

Report Date: 9/6/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
12089977	West-W 01	Flame	Wipe	****	0.108	110	ug/ft²	17	160	ug/ft²	
12089978	West-W 02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089979	West-W 03	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
12089980	West-W 04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089981	West-W 05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089982	West-W 06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089983	West-W 07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089984	West-W 08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089985	West-W 09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089986	West-W 10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089987	West-W 11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12089988	West-Bulk 01	Flame	Paint Chip	****	N/A	0.0066	%Pb		<0.0066	%Pb	

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Westbrook RC	**Chain Of Custody:**	513788
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Westbrook, CT	**Date Submitted:**	8/30/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	9/6/2012

Report Date: 9/6/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: Non-Responsive

Technical Manager Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NY ELAP, AIHA, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Westbrook RC	**Chain Of Custody:**	513788
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Westbrook, CT	**Date Analyzed:**	9/6/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-676	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12089989	West-Bulk 02	NAD	--	--	--	--	--	--	--	--	--	100	Paint	White	Homogeneous	LBP	
12089990	West-Bulk 03	NAD	--	--	--	--	--	--	--	--	--	100	GZ	White	Homogeneous	LBP	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Technical Director Non-Responsive **Analyst(s)** Non-Responsive

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

NVLAP (101143-0) Accredited Laboratory
4475 Forbes Blvd. · Lanham, MD, 20706 · (301) 459-2640 · Toll Free (800) 346-0961 · Fax (301) 459-2643

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OWI (410) 247-2024

Westbrook RC 159202

210 REV. 6.08

AMA Analytical Services, Inc.

Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) ITARNG 513788

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: Westbrook RC
2. Job Location: West Brook, CT
3. Job #: 512-676 PO #: W912K6-09-A-0003
4. Contact Person: [redacted]
5. Submitted by: [redacted] Signat[redacted]

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
- ☐ Immediate Date Due:
- ☐ 24 Hours Time Due:
- Comments:

NORMAL BUSINESS HOURS
- ☐ Immediate
- ☐ Next Day
- ☐ 2 Day
- ☐ 3 Day
- ☒ 5 Day + Date Due: 9/7/12
- ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
- ☒ In[redacted] th Report
- ☐ Fa[redacted] us.army.mil
- ☐ Ve[redacted] us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☒ EPA 600 – Visual Estimate 2 (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
- ☒ Pb Paint Chip 1 (QTY)
- ☒ Pb Dust Wipe (wipe type 10cm²) 11 (QTY)
- ☐ Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☐ Spore-Trap (QTY)
- ☐ Surface Swab (QTY)
- ☐ Surface Tape (QTY)
- ☐ Other (Specify) (QTY)
- ☐ Surface Vacuum Dust (QTY)
- ☐ Culturable ID Genus (Media) (QTY)
- ☐ Culturable ID Species (Media) (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WATER AND OTHER	SPORE TRAP	TAPE	SWAB
See attached Sheet																

CLIENT CONTACT

(LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 8/20/12 @ 1036 Via: FEDEX
2. Date/Time Analyzed: 9/7/12 @ 18:30 By (Prin[redacted]
3. Results Reported T[redacted]
4. Comments: 7981 2220178

[redacted]

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Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING
SURVEY SHEET

Date Collected: 8/22/12

Job Site: Westbrook

Project No.: J12-676

Inspector: [redacted] Non-Responsive

Sample No.	Sample Type	Sample Location	Dimensions (Area)
West-W01	Lead	Dill Hall - high window sills	60X10
" W02		Dill Hall - center of floor	
" W03		Dill Hall - pipe run	
" W04		Dill Hall - floor under heavy windows	
" W05		Dill Hall - sewing center	
" W06		Kitchen - prep tables	
" W07		former IFR - front end (painted floor)	
" W08		former IFR - top of file cab (dusty)	
" W09		former IFR - end of locker room bulkhead	
" W10		foyer (and of IFR) dusty corners (painted floor	
" W11		fitness Center	
west-bulk-01	(Lead)	paint chips near high windows in Dill Hall	
west-bulk-02	(A+b)	asbestos - black gasket material in Dill Hall	
west bulk-03	(A+b)	window glazing Dill Hall	

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Appendix C
Photo Documentation

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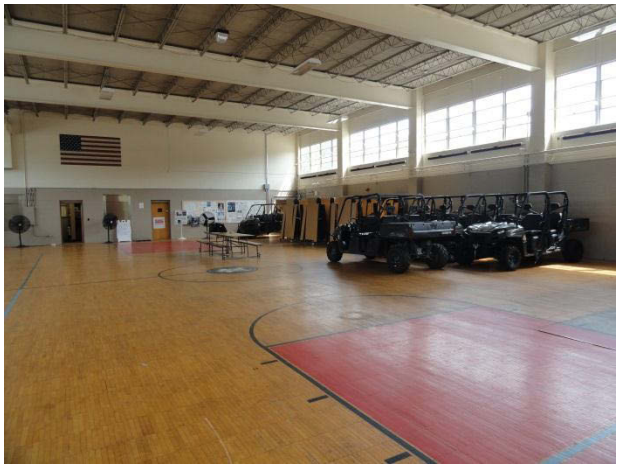
Westbrook, CT Readiness Center

Drill Hall



Drill Hall

Kitchen

Kitchen

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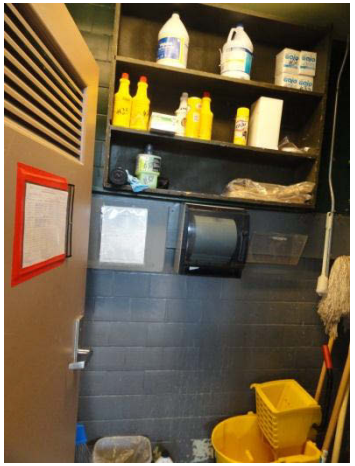
Westbrook, CT Readiness Center

Kitchen

Storage

Latrine



Custodial closet

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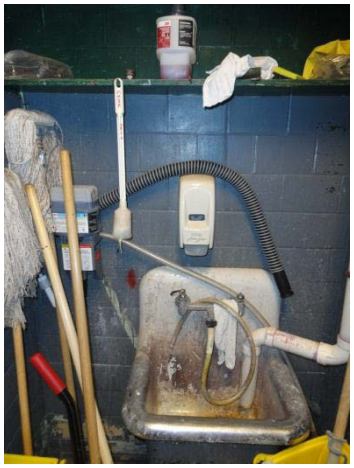
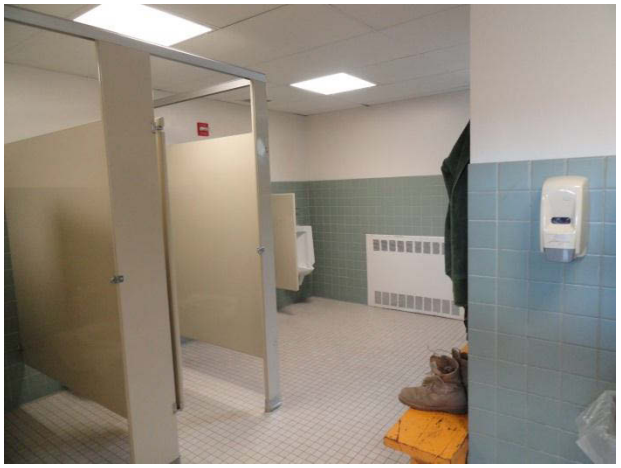
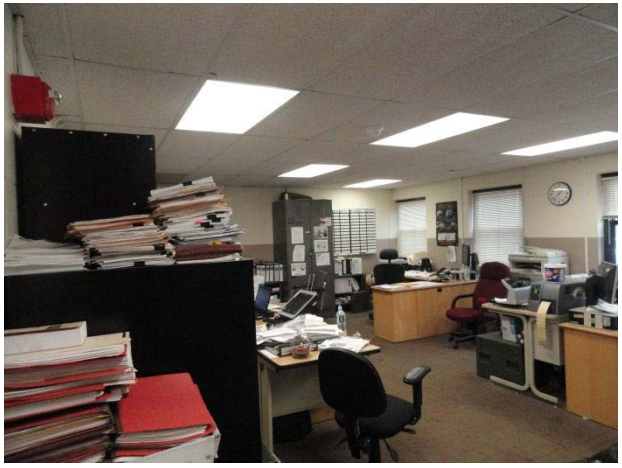
Westbrook, CT Readiness Center



Custodial Closet



Latrine



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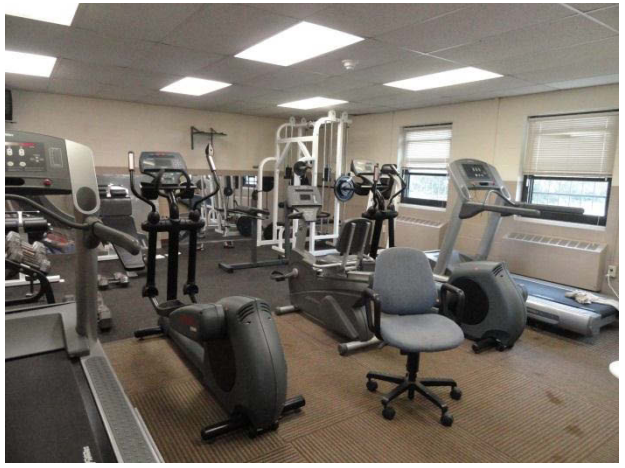

Fitness Center

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Westbrook, CT Readiness Center

Boiler Room

Boiler Room

Supply Room

Back Lobby

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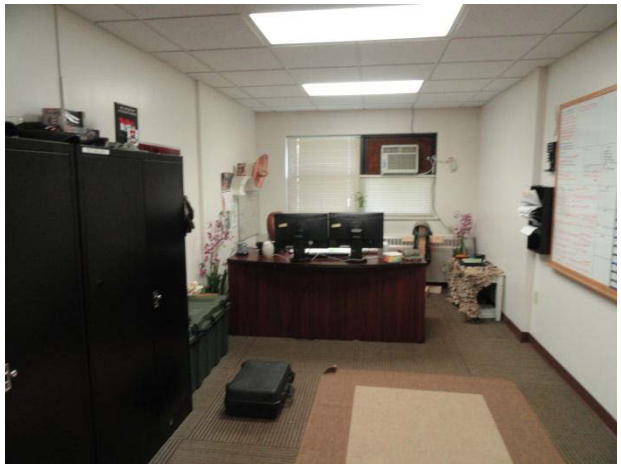
Westbrook, CT Readiness Center



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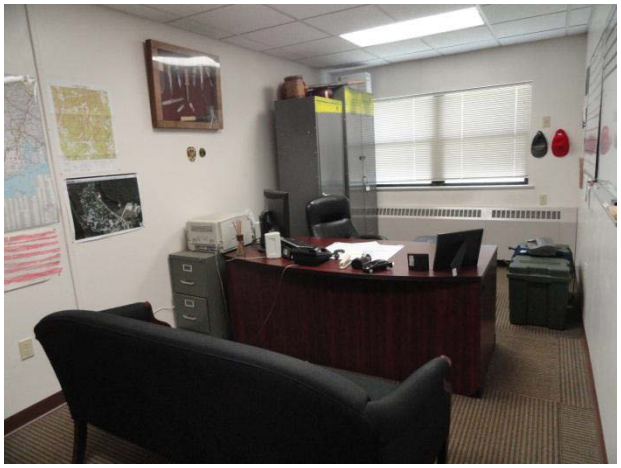

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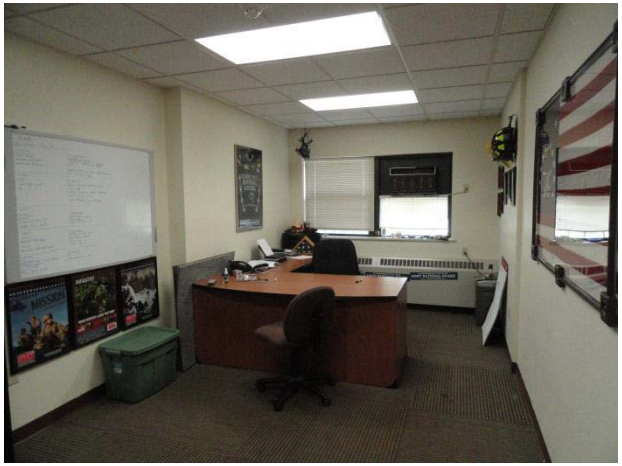

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Appendix D
IAQ and Lighting Survey Log Sheets

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Connecticut	City	Westbrook	IAQ							Light		
Date	8/22/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400L
Facility Description	Readiness Center			Serial Number		6296					Serial Number		3021
Weather Conditions				Last Calibration		Mar-12					Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Drill Hall		3	16:14	81.8	X	56.2		444		0.5		50-75		50
Locker Room (Former Range)		1	16:15	80.7	X	56.2		420		0.4		46-95		7
HRF Office		4	16:18	77.7		52.2		680		0.4		30-80		30-50
1st Sergeant Office		1	16:18	76.1		40.3		578		0.3		100-200		30-50
Middle Office		1	16:19									100-200		30-50
3rd Office		1	16:19	71.7	X	42.2		428		0.4		70-125		30-50
Kitchen Area		1	16:20	79.2		62.7	X	414		0.0		70-166		50
Women's Bathroom/Shower		1	16:21	79.5		59.0		495		0.1		20-110		5
Custodial Closet		1										80-90		30
Foyer		1										90-200		15
Fitness Center		2	16:25	79.5		57.9		420		0.1		55-175		30
Boiler Room		3	16:26	81.6	X	56.1		388		0.0		29-1,000		30
Supply Office		6	16:32	76.6		35.4		1,174		0.3		70-125		30-50
Supply Room		6	16:32	78.9		63.8	X	466		0.0		40-175		30-50
Supply Office		1	16:33									6.5-180	X	30-50
Outside			16:26	80.2		56.1		384		0.1				

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