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
ADAMS ARMORY
ADAMS, MASSACHUSETTS

February 2006
PN: 39741508

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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APPENDICES

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 two of the areas measured.	Increase lighting in the administrative areas. While work is in progress through use of task lighting, 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	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j)	RAC 3
Hazard Communication		
No inventory list of the site's chemicals was provided.	Conduct an annual hazardous chemical inventory annually (OSHA 29 CFR 1910.1200(e)(1(i))	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 firing range 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 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 Adams Armory located at 89 Park Street in Adams, Massachusetts 01220. This report includes an executive summary and a description of the site activities and findings and a list of conclusions and recommendations.

On January 29, 2004 Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Adams, Massachusetts. 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. Armorer Non-Responsive of the Massachusetts ARNG was Mr. Non-Responsive site contact for this survey.

This armory is a two-story 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. The building was constructed in 1914. A layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A. There were no photographs taken at this facility.

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. 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.

Unlisted containers of paints and thinners were observed in the janitor's closet.

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 locker room, basement floor hall, boiler room, drill floor, recruiting, mess 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 ranged from 12.8-18.8 % throughout the various building areas with an average of 15.4%. 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 478 to 561 parts per million (ppm), with an average of 512 ppm. The outside reading was 472 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 (62.1-2004) recommends that levels of carbon dioxide be maintained below 700 ppm above the outside level. Given an outside level of 472 ppm on the day of the survey, the ASHRAE limit would be 1,172 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide concentrations ranged from 0.5 to 1.6 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 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)
Mess Hall	Cafeteria	18	20
Locker Room	Storage	33	20
Recruiting	Office	41	50

On the day of the survey the illumination in the administrative areas, and mess hall areas were 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 disorganized and the housekeeping was poor. 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 most offices. URS recommends increasing the area lighting or supplementing existing lighting 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.

ASBESTOS: Asbestos-containing floor tile was observed to be in fair condition throughout the facility. These materials should be monitored under an operations and maintenance program.

HAZARD COMMUNICATION: Unlisted containers of paints and thinners were observed in the janitor's closet.

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 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 ($\mu g/ft^2$)
Former Firing Range East, top of Locker	129-15	1.00	71	200
Former Firing Range West, Top of Locker	129-16	1.00	220	200
Former Firing Range West, top of Light	129-17	1.00	19,000	200
Former Firing Range East, Floor	129-18	1.00	930	200
Former Firing Range West, Floor	129-19	1.00	11,000	200
Blank	129-21	N/A	<12 µg	N/A

OSHA has no specific requirement for lead contamination on work area surfaces. The OSHA 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.

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.

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
Level of Lead Found in the Air

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	129-01	225	<13	30
Blank	129-03	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 action level for lead (29 CFR 1910.1025(c)) of 30 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

3.3 Ventilation System Evaluation

Not applicable tot his 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: Four of the five surfaces 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 from lead-based paint. 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.

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 and storing vehicles. The walls are constructed of cinder blocks with a concrete floor. At the time of the industrial hygiene survey children were using the armory.

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 Floor West	0129-12	10x10 cm	160	200
Drill Floor North	0129-14	10x10 cm	730	200
Blank	129-21	N/A	<12 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 the drill hall. Table 4-2 below shows the result of this air sample.

Table 4-2
Airborne Concentration of Lead

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA Lead Action Level ($\mu g/m^3$)
Drill Floor West	129-02	263	<11	30.0
Blank	129-03	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 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 the acceptable level of 200 micrograms per square foot as defined by the National Guard Region North IH Office. 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 IH Office has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

ASBESTOS: Asbestos-containing floor tile should be monitored under an approved operations and maintenance program.

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.

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. No training records were 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.

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

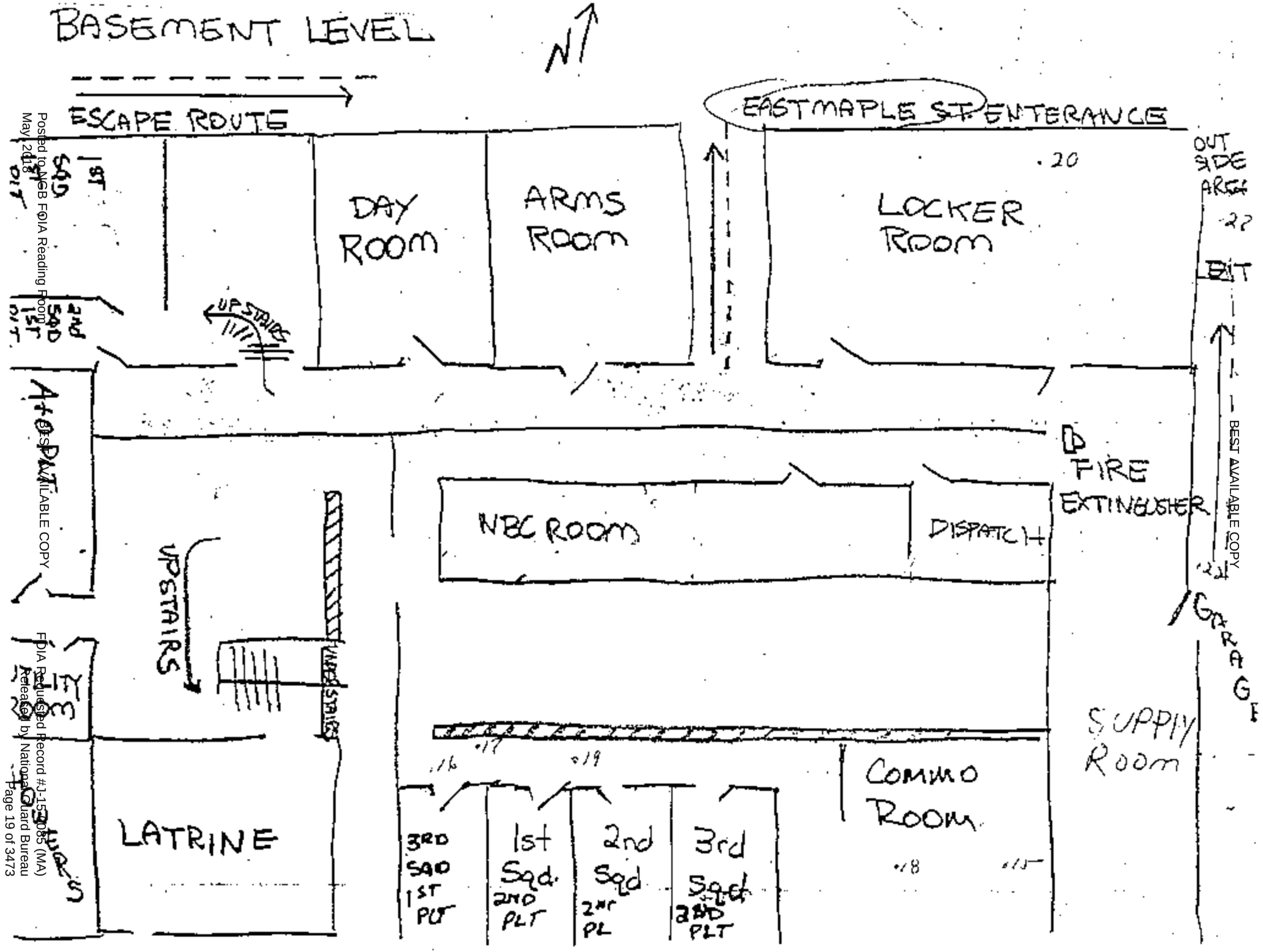
Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

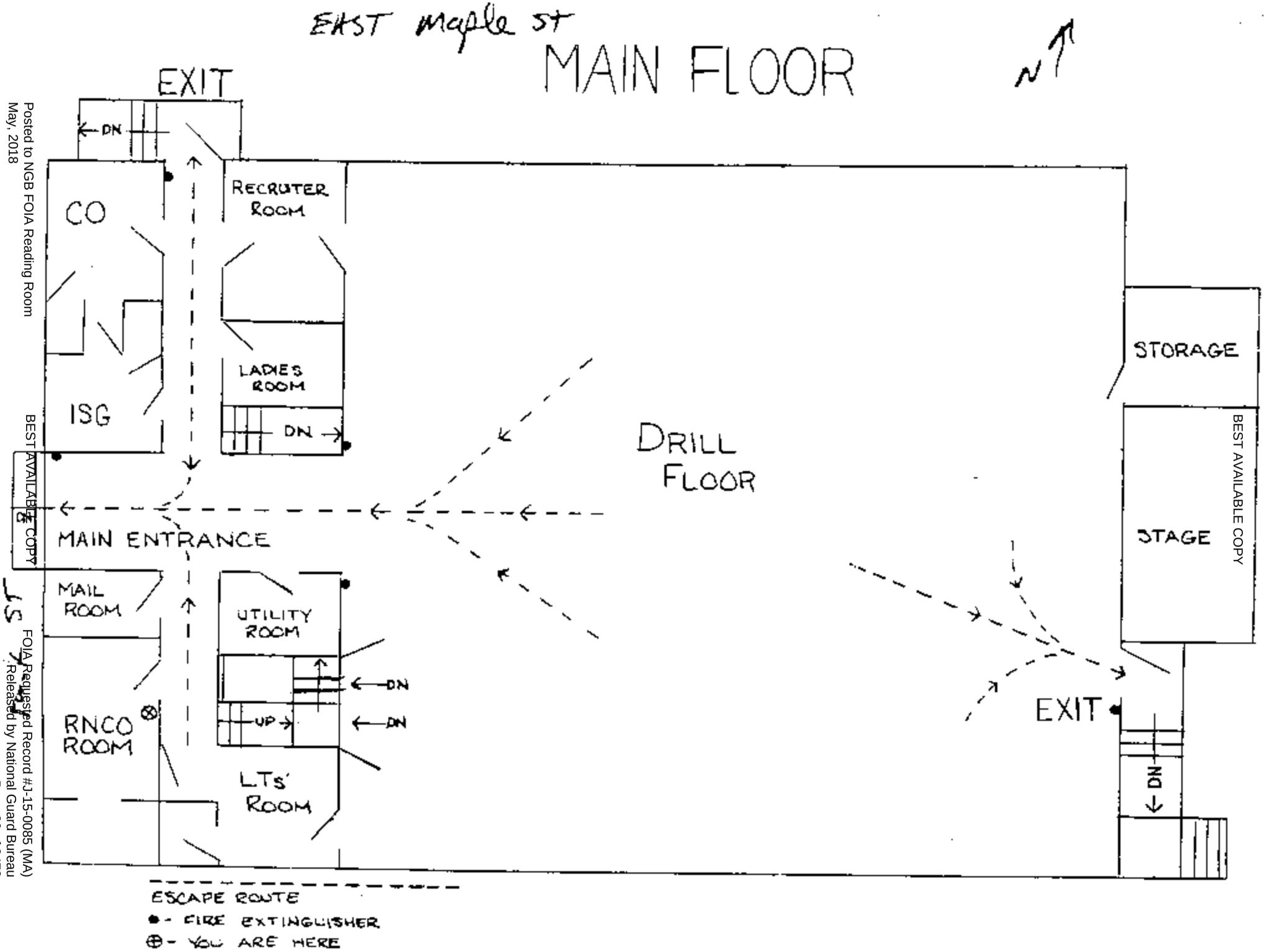
U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

APPENDIX A

ARMORY DRAWING





APPENDIX B

PERSONNEL LIST

NOT PROVIDED

APPENDIX C

HAZARDOUS MATERIALS LIST

NOT PROVIDED

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Adams Armory	**Chain Of Custody:**	122806
Address:	301-111 Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Adams, MA	**Date Analyzed:**	02/17/2004
	Havre de Grace, Maryland 21078	**Job Number:**	39741509.00301	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	17-Feb-04

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
0423861	129-04	Flame	Wipe	****	1.000	12.00	ug/ft^2		320	ug/ft^2	
0423862	129-06	Flame	Wipe	****	1.000	12.00	ug/ft^2		71	ug/ft^2	
0423863	129-12	Flame	Wipe	****	1.000	12.00	ug/ft^2		160	ug/ft^2	
0423864	129-14	Flame	Wipe	****	1.000	12.00	ug/ft^2		730	ug/ft^2	
0423865	129-22	Flame	Wipe	****	1.000	12.00	ug/ft^2		580	ug/ft^2	
0423866	129-15	Flame	Wipe	****	1.000	12.00	ug/ft^2		71	ug/ft^2	
0423867	129-16	Flame	Wipe Blank	****	1.000	12.00	ug/ft^2		220	ug/ft^2	
0423868	129-17	Flame	Wipe	****	1.000	12.00	ug/ft^2		19000	ug/ft^2	
0423869	129-18	Flame	Wipe	****	1.000	12.00	ug/ft^2		930	ug/ft^2	
0423870	129-19	Flame	Wipe	****	1.000	12.00	ug/ft^2		11000	ug/ft^2	
0423871	129-21	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0423872	129-01	Flame	Air	225	N/A	13.33	ug/m^3	<	13	ug/m^3	
0423873	129-02	Flame	Air	263	N/A	11.41	ug/m^3	<	11	ug/m^3	
0423874	129-03	Flame	Air Blank	0	N/A	3.00	ug/m^3	<	3	ug	

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Adams Armory	**Chain Of Custody:**	122806
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Adams, MA	**Date Analyzed:**	02/17/2004
	Havre de Grace, Maryland 21078	**Job Number:**	39741509.00301	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	17-Feb-04
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 results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] **nical Manager:** [redacted]

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

APPENDIX E

TRAINING CERTIFICATES

Non-Responsive

Certificate of Training

Awarded to

[redacted]

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] *CIH, CSP, RS*

[redacted] *Training Director*

APPENDIX F

PHOTOGRAPHS

NOT PROVIDED

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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.

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.

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)

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).

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.

[redacted]

(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.

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.

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 operatiou 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.

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.

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.

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.

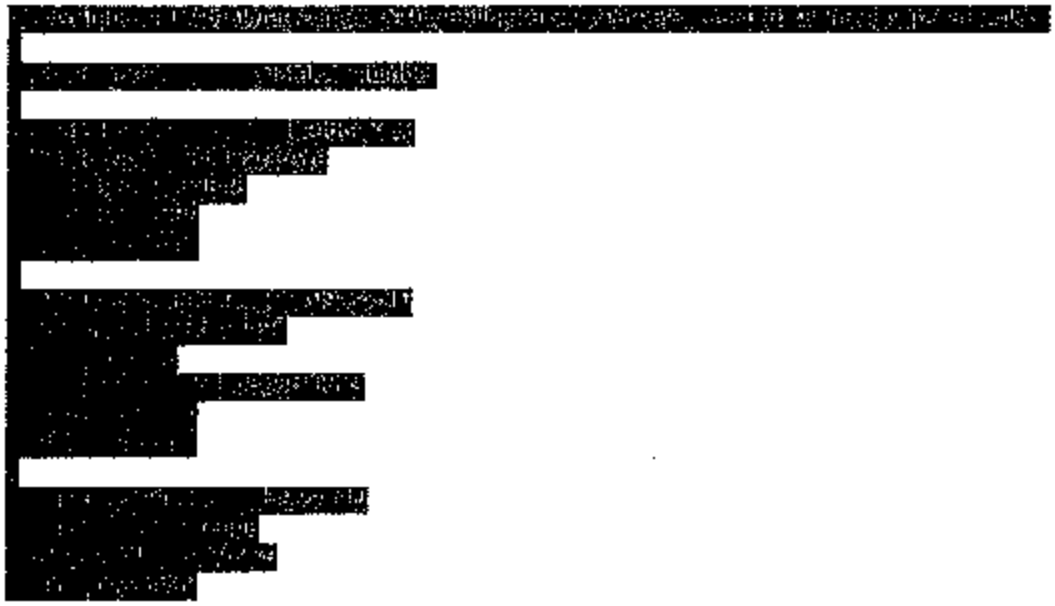
Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381M

APPENDIX E (Continued)

800-247-8628
800-358-3041

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

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

APPENDIX O
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:			

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:		

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

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.

BEST AVAILABLE COPY

Industrial Hygiene Survey

Massachusetts Army National Guard (MA ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Agawam Readiness Center
140 Maynard Street
Feeding Hills, MA 01030-1439

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

Survey Date: July 27, 2010
Report Date: September 9, 2010

AEI Project #: J10-513 3a MA Agawam RC

Non-Responsive

Industrial Hygienist

Table of Contents

List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Agawam Readiness Center located at 140 Maynard Street, Feeding Hills, MA, 01030-1439. Non-Responsive Non-Responsive performed the evaluation on July 27, 2010. The point of contact for the facility was First Lieutenant 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) evaluations of operations including operation description, 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:

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.

Lead in Air Samples: Results of collected air samples were below regulatory limits for lead.

Paint Chip and Wipe Samples for Lead Contamination: Results of dust wipe samples taken throughout the facility including the former firing range were not considered lead contaminated. No peeling or flaking paint was observed at the Agawam Readiness Center.

Visual Inspection for Damaged Asbestos-Containing Materials: Damaged TSI pipe fittings were observed that might contain asbestos behind the desk in the Officer's Room and at the radiator in the Ammo Room. Bulk samples of the material resulted in 15 and 70% Chrysotile asbestos respectively.

Visual Inspection for Water Damage and Mold Growth: No visual evidence of water damage or mold growth was observed in the facility.

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: The evaluation indicated that there are some illumination deficiencies in one office and the Mechanical Room. The illumination measurements indoors ranged from a low of 17.4 foot candles (fc) to a high of 120.3 fc.

Indoor Air Quality: Temperatures and relative humidity measurements were outside the acceptable range in most of the facility. These results are not unexpected due to outdoor conditions on the day of the survey and the lack of air conditioning in most of the facility. Indoor levels of carbon monoxide ranged from 0 to 0.4 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Massachusetts Army National Guard (MA ARNG) Agawam Readiness Center located at 140 Maynard Street, Feeding Hills, MA, 01030-1439. Non-Responsive illi performed the evaluation on July 27, 2010. The point of contact for the facility was First Lieutenant 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 Agawam Readiness Center is staffed with 3 fulltime National Guard administrative 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 Agawam 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 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 Agawam facility consists exclusively of supply and administrative duties. No maintenance of vehicles, painting of equipment or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the Armorer 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

Heat is supplied to the facility through a boiler located in the boiler room and overhead heaters in the drill hall. The boiler certificate for the Agawam facility expired in 2003 and is not up to date. Any air conditioning provided to the building is through window air conditioning units. No local ventilation systems were present at 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 peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices. Lighting and indoor air quality measurements were taken in all areas of the facility as well.

Lead in Air Samples

To determine if any airborne contamination of lead existed in the facility, air sampling for lead was conducted in the Officer's Room and the Orderly's Room and analyzed by AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Lead in Air Sampling for the MA ARNG Agawam Readiness Center on July 27, 2010.

Air Sample #	Sample Location	Result (µg/m³)*
AGA-01	Orderly's Room, on top of file cabinet	<6.1
AGA-02	Officer's Room, On Desk	<6.2

*The OSHA PEL for Lead in Air is 50 µg/m³.

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 areas of peeling or flaking paint were 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 10cm x 10cm templates. Wipe samples for surface dust were collected in 15 locations including the former firing range which was converted to usable space. The Environmental Protection Agency (EPA) and the Commonwealth of Massachusetts limits for lead in dust are 40 micrograms per square foot (µg/ft²) on floors, 250 µg/ft² on window sills, and 400 µg/ft² 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 Center for Health Promotion and Preventive Medicine (USACHPPM) recommended maximum level for adult exposures of 200 µg/ft² on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to Aerosol Monitoring and Analysis Analytical Services, Inc. (AMA) for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. The wipe samples were all below the National Guard criteria for lead contamination (200 µg/ft²). Results are given in Table 2 and certificates of analysis are included in Appendix B.

Table 2 – Results of Dust Wipe Sampling for the MA ARNG Agawam Readiness Center on July 27, 2010.

Wipe Sample #	Sample Location	Result (µg/ft²)*
AGA-PB-01	Kitchen, From Counter Top	<12
AGA-PB-02	Orderly Room, From Vent Grill	<12
AGA-PB-03	Assembly Hall, On Top Of Storage Cabinet	<12
AGA-PB-04	Assembly Hall, On Top Of Desk	<12
AGA-PB-05	Assembly Hall, Center Of Floor	<12
AGA-PB-06	Classroom, From Desktop/ AV Table	<12
AGA-PB-07	Room 15, From Top Of Locker	<12
AGA-PB-08	Supply Room, From Supply Counter	180
AGA-PB-09	Commander's Office, From Top Of Cabinet	<12
AGA-PB-10	Entry Way, From Top Of Steps On Floor	<12
AGA-PB-11	Room 9, From Exhaust Fan, Former Firing Range	17
AGA-PB-12	Room 9, Light Fixture Former Firing Range	<12
AGA-PB-13	Room 9, From Stored Chairs Former Firing Range	<12
AGA-PB-14	Room 9, From Middle of Floor Up Former Firing Range	20
AGA-PB-15	Floor immediately Outside Former Firing Range	<12

*The US Army CHPPM recommends a maximum level for adult exposures of 200 µg/ft² lead on floors

Visual Inspection for Damaged Suspect Asbestos-Containing Materials

A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged TSI pipe fittings were observed behind the desk in the Officer's Room and at the radiator in the Ammo Room. 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) using EPA method 600/R-93/116. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. Bulk samples of the material resulted in 15 and 70% Chrysotile asbestos respectively. Results are given in Table 3 and certificates of analysis are included in Appendix B.

Table 3 – Results of Asbestos Sampling for the MA ARNG RC Agawam, MA on July 27, 2010.

Bulk Sample #	Sample Location	Result (%)
AGA-ASB-01	Damaged Fitting in Officer's Room	15% Chrysotile
AGA-ASB-02	Damaged Boiler Breeching/Exhaust	70% Chrysotile

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. There was no evidence of water damage or mold growth at the facility.

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

Illumination levels were measured using a Cal-Light 400L, calibrated on July 30, 2009, 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 that there are some illumination deficiencies in one office and the Mechanical Room. The illumination measurements indoors ranged from a low of 17.4 foot candles (fc) to a high of 120.3 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination. Additional illumination can be achieved by replacing burned-out lamps, cleaning fixtures, relocating detailed work to more illuminated areas, using supplemental task lighting, and opening doors or windows to provide more natural lighting.

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 7565-X, factory calibrated in September 2008. 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) 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 55-2004. These ranges are presented in Table 4. 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 4 - 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 55-2004

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 74.2 to 80.1° F and 37.9 to 58.2% Rh. Outdoor temperature and humidity measurements were 80.1° F and 53.0% on the day of monitoring. Temperatures and relative humidity measurements were outside the acceptable range in most of the facility. These results are not unexpected due to outdoor conditions on the day of the survey and the lack of air conditioning in most of the facility. Those areas with window air conditioning units were within acceptable ranges.

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 – 2007 as 700 ppm above outdoor concentrations. Indoor concentrations of CO_2 ranged from 350 to 564 parts per million (ppm) and outdoor CO_2 levels were approximately 380 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange.

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 62.1-2007 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 to 0.4 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, peeling lead-based paints, cross contamination from the former firing range, noise hazards, visible mold and housekeeping. The results of the evaluation indicated industrial hygiene concerns in the following areas: the presence of damaged suspect asbestos-containing materials, indoor air quality, and lighting. Overall, Agawam Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees.

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, sate, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

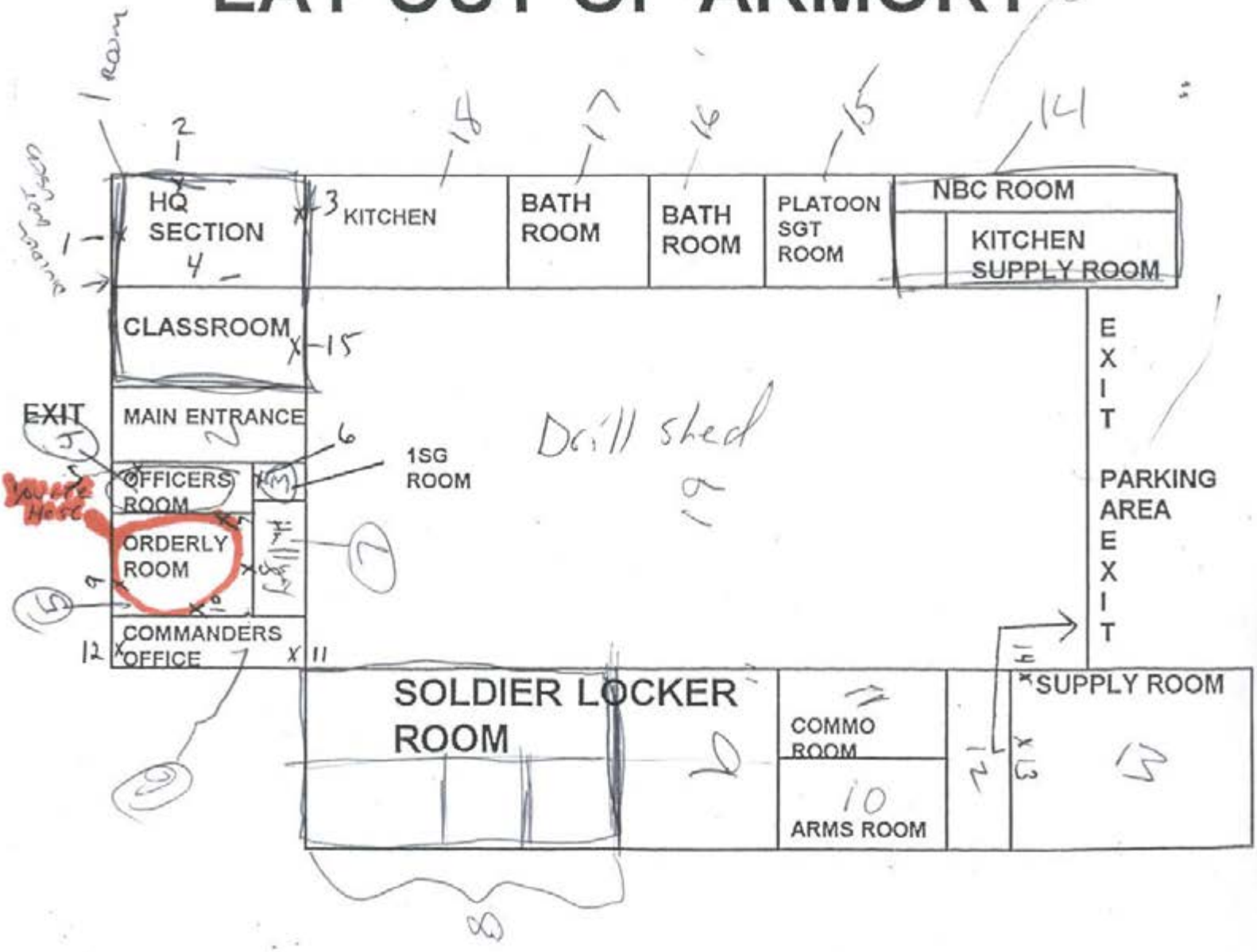
9 References

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, August 23, 2007.
6. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 15, 1998.
7. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
8. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
9. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
10. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
11. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2007, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2004, "Thermal Environmental Conditions for Human Occupancy".
12. NIOSH website: http://www.cdc.gov/niosh/

13. OSHA website: http://www.osha.gov/.
14. Army CHPPM website: http://chppm-www.apgea.army.mil/.
15. EPA website: http://www.epa.gov.

Appendix A
Building Layout

LAY OUT OF ARMORY



Appendix B
Certificates of Analysis for Air, Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Agawam Amory	**Chain Of Custody:**	508468
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Agawam, MA	**Date Analyzed:**	8/6/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**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 Color	Homogeneity	Analyst ID	Comments
1066533	AGA-ABS-01	15	15	--	--	--	45	--	TR	--	--	40	Multi	Layered	SW	
1066534	AGA-ABS-02	70	70	--	--	--	--	--	--	--	--	30	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

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) **508468**

PV2

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: AGAWAM ARMORY
2. Job Location: AGAWAM MA
3. Job #:
4. Contact Person: Non-Responsive 42-0273
5. Submitted by:

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: 8/9/10
❑ 2 Day
❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ Em Non-Responsive @us.army.mil
❑ Fax:
❑ 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 °C)

Metals Analysis
❑ Pb Paint Chip (QTY)
☒ Pb Dust Wipe (wipe type Gloss) 15 (QTY)
☒ Pb Air 2 (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	CLIENT CONTACT (LABORATORY STAFF ONLY)
AGA-01		7/27/10	491.6					X		X							Date/Time: Contact: By:
AGA-02			484							X							
AGA-PB-01				10x10 GW								X					
AGA-PB-02																	
AGA-PB-03																	Date/Time: Contact: By:
AGA-PB-04																	
AGA-PB-05																	
AGA-PB-06																	
AGA-PB-07																	Date/Time: Contact: By:
AGA-PB-08																	
AGA-PB-09																	
AGA-PB-10																	

LABORATORY STAFF ONLY:
1. Date/Time RCVD: 8/2/10 @ 1000 Via:
2. Date/Time Analyzed Non-Responsive By (Print):
3. Results Reported To: Via: EM
4. Comments:

Non-Responsive

Non-Responsive

Time: Initials: SW

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) 50CA168 p2/2

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: AGAWAM ARMORY
2. Job Location: AGAWAM MA
3. Job #:
4. Contact Perso
5. Submitted by:

Non-Responsive

Reporting Information (Results will be provided

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due:	❑ Immediate ❑ 3 Day	☒ Include COC/Field Data Sheets with Report
❑ 24 Hours Time Due:	❑ Next Day ❑ 5 Day +	☒ Ema Non-Responsive
Comments:	❑ 2 Day Date Due:	❑ Fax:
	❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	❑ Verb

Ashestos 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) (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	MATRIX: DUST	WIPES AND CANISTER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
AGA-PB-C1		7/27/16		10X100				X				X					Date/Time: Contact: By:
AGA-PB-12				↓				↓				↓					
AGA-PB-13																	
AGA-PB-14																	
AGA-PB-15				↓				↓				↓					Date/Time: Contact: By:
AGA-ASB-01							X				X						
AGA-ASB 02							X				X						
																	Date/Time:

LABORATORY STAFF ONLY:

1. Date/Time RCVD: / / @ Via:
2. Date/Time Analyzed: By (Print AVAILAB
3. Results Reported T Date: / / Time: Released
4. Comments:

Non-Responsive

Non-Responsive

Non-Responsive

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

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Agawam Amory	**Chain Of Custody:**	508468		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Agawam, MA	**Date Submitted:**	8/2/2010		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/6/2010	**Report Date:**	8/9/2010
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
1066516	AGA-01	Flame	Air	492	N/A	6.1	ug/m³	<3	<6.1	ug/m³	
1066517	AGA-02	Flame	Air	484	N/A	6.2	ug/m³	<3	<6.2	ug/m³	
1066518	AGA-Pb-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066519	AGA-Pb-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066520	AGA-Pb-03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066521	AGA-Pb-04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066522	AGA-Pb-05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066523	AGA-Pb-06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066524	AGA-Pb-07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066525	AGA-Pb-08	Flame	Wipe	****	0.108	110	ug/ft²	180	1600	ug/ft²	
1066526	AGA-Pb-09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066527	AGA-Pb-10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066528	AGA-Pb-11	Flame	Wipe	****	0.108	110	ug/ft²	17	150	ug/ft²	
1066529	AGA-Pb-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066530	AGA-Pb-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066531	AGA-Pb-14	Flame	Wipe	****	0.108	110	ug/ft²	20	190	ug/ft²	
1066532	AGA-Pb-15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

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

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Agawam Amory	**Chain Of Custody:**	508468		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Agawam, MA	**Date Submitted:**	8/2/2010		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/6/2010	**Report Date:**	8/9/2010
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)-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) 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 sampes.
NY ELAP accreditation applies only to paint chip, wipe, and soil samples.

Analyst: Non-Responsive

Technical Manager: Non-Responsive

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) **508468**

PD

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: AGAWAM ARMORY
2. Job Location: AGAWAM MA
3. Job #:
4. Contact Person: [redacted] 942-0273
5. Submitted by: [redacted]

Non-Responsive

Reporting Information (Results will be provided

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due:	❑ Immediate ❑ 3 Day	☒ Include COC/Field Data Sheets with Report
❑ 24 Hours Time Due:	❑ Next Day ☒ 5 Day + 8/9/10	☒ Ema[redacted]@us.army.mil
Comments:	❑ 2 Day Date Due:	❑ Fax:
	❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	❑ Verb[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 _____ (QTY)
- ☒ Pb Dust Wipe (wipe type GHOST) 15 (QTY)
- ☒ Pb Air 2 (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	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
AGA-01		7/27/10	491.6	[redacted]				X		X						
AGA-02			484							X						
AGA-PB-01				10x10cm								X				
AGA-PB-02																
AGA-PB-03																
AGA-PB-04																
AGA-PB-05																
AGA-PB-06																
AGA-PB-07																
AGA-PB-08																
AGA-PB-09																
AGA-PB-10																

CLIENT CONTACT (LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

Non-Responsive

LABORATORY STAFF ONLY:
1. Date/Time RCVD: 8/2/10 @ 900 Via: [redacted] By (Print)
2. Date/Time Analyzed: ____/____/____ @ ____ By (Print): ____
3. Results Reported To: ____ Via: ____ Date: ____/____/____ Initials: ____
4. Comments: ____

(CONTINUED)

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) 50C4164 pg2

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: AGAWAM ARMORY
2. Job Location: AGAWAM MA
3. Job #: _____ P.O. #: W912K6-09-A-0003
4. Contact Perso[redacted]2-0273
5. Submitted by: 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	☒ Include COC/Field Data Sheets with Report
❑ 24 Hours Time Due: _____	❑ Next Day ❑ 5 Day +	☒ Email: Non-Responsive@
Comments: _____	❑ 2 Day Date Due: _____	❑ Fax: [redacted]@us.army.mil
	❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	❑ Verb[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 _____) _____ (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)

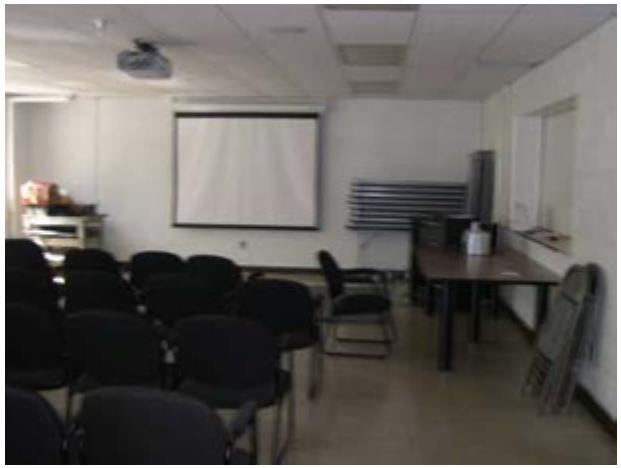
CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
AGA-PB-01		7/27/16		10x10cm				X				X					Date/Time: Contact: By:
AGA-PB-12				↓				↓				↓					
AGA-PB-13																	
AGA-PB-14																	
AGA-PB-15																	Date/Time: Contact: By:
AGA-ASB-01							X				X						
AGA-ASB-02							X				X						
																	Date/Time:

Non-Responsive

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: ____/____/____ @____ Via: _____ By (Print): _____
2. Date/Time Analyzed: ____/____/____ @____ By (Print): _____ Sign: _____
3. Results Reported To: _____ Via: _____ Date: ____/____/____ Time: _____
4. Comments: _____

Appendix C
Photo Documentation

Agawam RC



Mess Hall and Class Room

Kitchen

Damaged Boiler Breeching

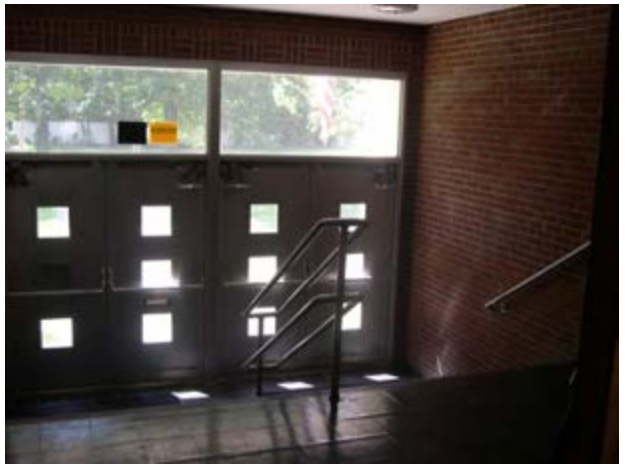
Boiler Room

Agawam RC

Former Bullet Trap

Storage Area, Former Firing Range

Drill Hall



Front Entry

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	Agawam	IAQ								Light		
Date	7/27/2010	Inspector	Non-Responsive	Instrument		Q-TRAK 7565-X						Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		7565X0839017						Serial Number		K070277
Weather Conditions				Last Calibration		Sep-08						Last Calibration		30-Jul-09
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Value (fc)
1	Classroom	0	08:42 AM	78.9	X	55.7	X	413		0.4		120.3		30-50
2	Entry	0	08:46 AM	75.8		56.1		365		0.0		17.4		10
3	ISG Office	1	08:48 AM	76.3		40.3		378		0.0		77.1		50
4	Office	1	08:49 AM	75.4		39.0		482		0.1		52.2		50
5	Office	1	08:55 AM	74.3		40.0		564		0.1		45.1	X	50
6	Office	0	08:56 AM	74.2		37.9		532		0.0		68.9		50
7	Hallway	0	08:57 AM	74.5		40.0		542		0.0		94.4		5
8	Offices	0	09:00 AM	77.0		54.9		372		0.0		69.7		50
9	Laser Range/ Storage	0	09:04 AM	78.4	X	54.9	X	389		0.0		28.3		5-30
10	Arms Room	0	09:06 AM	79.3	X	58.2	X	502		0.1		26.3		10
11	Storage	0	09:10 AM	79.6	X	54.4	X	434		0.1		62.3		5-30
12	Hallway	0	09:11 AM	78.0		54.5		383		0.1		111.8		5
13	Supply room	0	09:13 AM	77.9	X	55.9	X	350		0.0		60.1		5-30
14	Mechanical Room	0	09:17 AM	79.3	X	53.8	X	362		0.1		19.8	X	30
15	Locker Room	0	09:18 AM	79.2	X	55.7	X	464		0.0		65.1		7
16	Men's Room	0	09:24 AM	77.9		53.0		386		0.0		72.7		5
17	Women's Room	0	09:25 AM	79.8	X	54.2	X	365		0.0		66.2		5
18	Kitchen	0	09:26 AM	80.1	X	52.9	X	374		0.0		56.4		50

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°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

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	Agawam	IAQ								Light		
Date	7/27/2010	Inspector	Non-Responsive	Instrument		Q-TRAK 7565-X						Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		7565X0839017						Serial Number		K070277
Weather Conditions				Last Calibration		Sep-08						Last Calibration		30-Jul-09
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Value (fc)
19	Assembly Hall	0	09:28 AM	80.1	**X**	53.0	**X**	383		0.0		42.1		30-50

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°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

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
AYER READINESS CENTER
219 BARNUM ROAD
AYER, MASSACHUSETTS

April 2006
PN: 39741508

Non-Responsive
Office Manager

Non-Responsive
Project Manager

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in approximately half 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
Lead		
Lead was detected in wipe samples collected from the top of the coca cola machine in the drill hall in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the drill hall where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
Damaged floor tile was present in office # 21 and in the kitchen # 17. Exposed tank insulation was found in the boiler room.	Repair or remove asbestos-containing floor tile and tank insulation. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001(k)(1))	RAC 3
No site specific asbestos operations and maintenance plan available.	Develop a site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
No site specific hazard communication plan available.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Electrical Safety		
Electrical panels were obstructed by equipment in room # 4.	Remove all obstructions in front of electrical panels in the drill hall for a minimum of 3 feet (OSHA 29 CFR 1910.303(g)(1)(i)).	RAC 4
Mold		
Watermarks were observed on the ceiling tiles. 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

FINDINGS AND RECOMMENDATIONS (Continued)

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
Confined Space		
A confined space located behind the bullet trap has not been evaluated	The MA ARNG must determine if any confined spaces are permit required confined spaces (OSHA 29 CFR 1910.(c)(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 Readiness Center located at 219 Barnum Road in Ayer, Massachusetts 01434. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On January 30, 2004, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Readiness Center in Ayer, Massachusetts. 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. Mr. Non-Responsive of the State of Massachusetts was Mr. Non-Responsive s site contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

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. Computer workstation chairs and armrests were in a fixed position and keyboards could not be adjusted in office #3 (Photo # 3472). 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.

Water marks on the ceiling in hallway # 18 (Photo # 3453) may indicate the potential for mold growth.

The electrical panel in the utilities room # 4 was obstructed (Photo # 3458).

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 14.4 – 16.0% with an average of 14.9%. This 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

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 350 to 415 parts per million (ppm), with an average of 365 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

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 350 ppm on the day of the survey, the ASHRAE limit would be 1050 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide was also measured in the Readiness Center. Carbon monoxide concentrations remained at 0 parts per million (ppm) throughout the survey period. The measured level was 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 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. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

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 Illuminance (foot candles)	Recommended Illuminance (foot candles)
Office # 1	Administrative Duties	184	50
Office # 2 – Right Front Desk	Administrative Duties	52	50
Office # 2 – Right Rear Desk	Administrative Duties	46	50
Office # 2 – Left Front Desk	Administrative Duties	47	50
Office # 3	Administrative Duties	109	50
Office # 20	Administrative Duties	355	50
Office # 21 – Rear Desk	Administrative Duties	145	50
Office # 21 – Front Desk	Administrative Duties	36	50
Office # 22	Administrative Duties	71	50
Hallway # 23	Accessway	26	3
Hallway # 24	Accessway	13	3
Hallway # 18	Accessway	15	3

On the day of the survey the illuminance in the administrative area was inadequate in a few offices.

2.2.5 Lead

Paint chips were collected in two areas where paint was peeling and sent to AMA Analytical Services, Inc. for analysis. Both 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 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)
Men's Shower Room #13	0130-LPC02	0.01	<0.0098
Room # 20	0130-LPC03	0.01	<0.0095

The analytical report from AMA is contained in Appendix D.

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 2-3 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 ($\mu g/ft^2$)
Room # 12 – Top of a File Cabinet	0130-LW04	1.000	19	200
Room # 20 – Top of a File Cabinet	0130-LW05	1.000	17	200
Office # 3 – Floor	0130-LW06	1.000	<12	200
Blank	0130-LWBlank	N/A	<12	200

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 (%)
Kitchen # 17	Pipefitting Insulation	0130-AB01C	NAD
Men's Shower # 20	Plaster Skim Coat	0130-AB03A	NAD
Men's Shower # 20	Plaster Skim Coat	0130-AB03B	NAD
Women's Room # 15	Plaster Skim Coat	0130-AB03C	NAD
Kitchen # 17	9"x9" Green Floor Tile	0130-AB04A-FT	3

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

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Kitchen # 17	9"x9" Green Floor Tile	0130-AB04B-FT	3
Kitchen # 17	9"x9" Green Floor Tile	0130-AB04C-FT	2
Kitchen # 17	Associated Mastic	0130-AB04A-M	NAD
Kitchen # 17	Associated Mastic	0130-AB04B-M	NAD
Kitchen # 17	Associated Mastic	0130-AB04C-M	NAD
Office # 20	Gypsum Board	0130-AB05A	NAD
Office # 20	Gypsum Board	0130-AB05B	NAD
Office # 20	Gypsum Board	0130-AB05C	NAD
Office # 21	9"x9" Black Floor Tile	0130-AB06A-FT	2
Office # 21	9"x9" Black Floor Tile	0130-AB06B-FT	2
Hallway # 24	9"x9" Black Floor Tile	0130-AB06C-FT	2
Office # 21	Associated Mastic	0130-AB06A-M	4
Office # 21	Associated Mastic	0130-AB06B-M	3
Hallway # 24	Associated Mastic	0130-AB06C-M	4
Office # 3	9"x9" Brown Floor Tile	0130-AB07A-FT	NAD
Office # 3	9"x9" Brown Floor Tile	0130-AB07B-FT	NAD
Office # 3	9"x9" Brown Floor Tile	0130-AB07C-FT	NAD
Office # 3	12"x12" White Ceiling Tile	0130-AB08A	NAD
Office # 3	12"x12" White Ceiling Tile	0130-AB08B	NAD
Office # 3	12"x12" White Ceiling Tile	0130-AB08C	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.

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 desks, chairs and monitors need to be corrected by fitting the workplace to the workers.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in a few offices. URS recommends increasing lighting in the few administrative areas. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: Five surfaces in the administrative area were tested for lead-based paint, none were found to contain lead.

ASBESTOS: Samples of the black and green floor tile that was present throughout this building area were determined to contain asbestos in a concentration greater than one percent (Photos # 3452 & 3456). It is recommended that the damaged tile be replaced with new, non-asbestos tile by an appropriately trained technician.

MOLD: The water stains on the ceilings could lead to mold problems if not addressed.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and this building area is now primarily used for storage, offices and a classroom.

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 ($\mu g/ft^2$)
Former Firing Range-Top of a Light	0130-LW07	0.750	79	200
Former Firing Range-Top of a File Cabinet	0130-LW08	1.000	<12	200
Former Firing Range-Floor-Pit	0130-LW09	1.000	35	200
Former Firing Range-Floor-Center	0130-LW10	1.000	<12	200
Former Firing Range-Floor-Front	0130-LW11	1.000	17	200
Blank	0130-LWBlank	N/A	<12	200

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
Levels 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	0130-LA01	1036	<2.9	50.0
Blank	0130-LA03	0	<3.0	50.0

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 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

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: The five surface wipe samples and one air sample collected in the former firing range were found to contain lead dust levels below the maximum limit set by the National Guard Bureau Region North Industrial Hygiene Office (See Appendix G).

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 5,400 square foot area with about a 30-foot high ceiling used for assembling personnel and storing equipment. The walls are constructed of cinder-block 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 # 9-Floor	0130-LW01	1.000	<12	200
Drill Hall # 9-Floor	0130-LW02	1.000	<12	200
Drill Hall # 9-Top of the Coca Cola Machine	0130-LW03	1.000	310	200
Blank	0130-LWBlank	N/A	130	200

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

Table 4-2
Levels 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	0130-LA02	1008	<3.0	50.0
Blank	0130-LA03	N/A	<3.0	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 50.0 $\mu g/m^3$ 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: The wipe sample collected from on top of the coca cola machine in the drill hall was found to contain lead. URS recommends cleaning the drill hall where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025). Additional lead wipes collected will be analyzed and a supplemental letter will report results.

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

One paint chip was collected 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 5-1 below shows the results of the lead paint testing.

Table 5-1
Levels of Lead in Paint Found in the Boiler Room

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room # 10	0130-LPC01	0.1	<0.011

The analytical report from AMA is contained in Appendix D.

5.2.2 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 5-2 below presents the results of the sample analysis.

Table 5-2
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Boiler Room # 10	Pipefitting Insulation	0130-AB01A	NAD
Boiler Room # 10	Pipefitting Insulation	0130-AB01B	NAD
Boiler Room # 10	Boiler Insulation	0130-AB02A	TR
Boiler Room # 10	Boiler Insulation	0130-AB02B	12
Boiler Room # 10	Boiler Insulation	0130-AB02C	5

NAD = "No Asbestos Detected"

TR = "Trace Amount of Asbestos" (Less than 1%)

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.

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 one surface tested in the boiler room area for lead was found to contain levels below the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. No further testing is required at this time.

ASBESTOS: Samples of the boiler insulation where found to contain asbestos in a concentration greater than one percent. The boiler insulation had some exposed sections (Photo # 3446) with some of it visible on the floor (Photo # 3447). It is recommended that the insulation be removed of repaired by an appropriately trained technician.

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 required for this site with a confined space behind the old bullet trap of the former firing range.

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. No training records were 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.

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

APPENDIX A

READINESS CENTER DRAWING

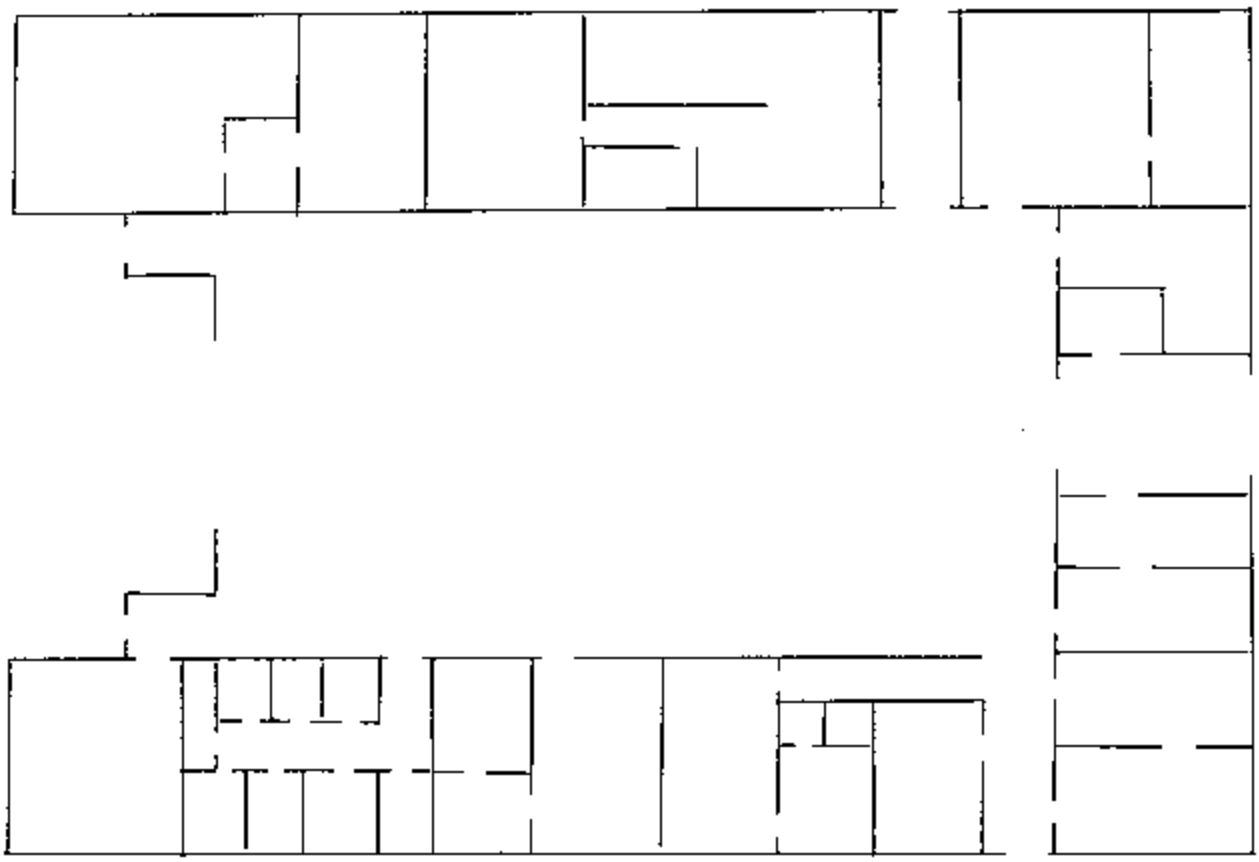
AYER, MA
01-30-04

DAY THERM
DAY/NIGHT THERM
MANUAL THERM
(THERM OPERATES WHEN O/H DOOR IS OPENED)
LIGHT/POWER ELECTRIC PANEL
ACCESS PANEL FOR WATER SHUTOFF
HEATING ZONE

FIRE PLAN. 1 JAN 94
726th Maintenance Co
National Guard Armory
Barnum Road (Fort Devens)
Ayer Ma.

YOU ARE HERE
FIRE EXTINGUISHER

AYER, MA - ARMY NATIONAL GUARD - ARMORY SITE PLAN



APPENDIX B

PERSONNEL LIST

PERSONEL LIST
AYER ARMORY

Name	Rank
Non-Responsive	SFC
	CIV
	SGT

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122701
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	219 Barnum Road, MA Ayer, MA	**Date Analyzed:**	2/9/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**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	Analyst ID	Comments
0423061	0130-AB 01 A	NAD	--	--	--	--	15	--	TR	--	--	85	Gray	LB	
0423062	0130-AB 01 B	NAD	--	--	--	--	15	--	TR	--	--	85	Gray	LB	
0423063	0130-AB 01 C	NAD	--	--	--	--	15	--	TR	--	--	85	Gray	LB	
0423064	0130-AB 02 A	TR	TR	--	--	--	15	--	--	--	--	85	Gray	LB	
0423065	0130-AB 02 B	12	5	7	--	--	--	--	--	--	--	88	White	LB	
0423066	0130-AB 02 C	5	5	--	--	--	30	--	--	--	--	65	Multi	LB	
0423067	0130-AB 03 A	NAD	--	--	--	--	--	--	--	--	--	100	White	LB	
0423068	0130-AB 03 B	NAD	--	--	--	--	--	--	--	--	--	100	White	LB	
0423069	0130-AB 03 C	NAD	--	--	--	--	--	--	--	--	--	100	White	LB	
0423070	0130-AB 04 A-FT	3	3	--	--	--	--	--	--	--	--	97	Green	LB	
0423071	0130-AB 04 B-FT	3	3	--	--	--	--	--	--	--	--	97	Green	LB	
0423072	0130-AB 04 C-FT	2	2	--	--	--	--	--	--	--	TR	98	Green	LB	
0423073	0130-AB 04 A-M	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0423074	0130-AB 04 B-M	NAD	--	--	--	--	--	--	TR	--	--	100	Black	LB	
0423075	0130-AB 04 C-M	NAD	--	--	--	--	--	--	TR	--	--	100	Black	LB	

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122701
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	219 Barnum Road, MA Ayer, MA	**Date Analyzed:**	2/9/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**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	Analyst ID	Comments
0423076	0130-AB 05 A	NAD	--	--	--	--	--	--	3	--	--	97	Multi	LB	
0423077	0130-AB 05 B	NAD	--	--	--	--	--	--	5	--	--	95	Multi	LB	
0423078	0130-AB 05 C	NAD	--	--	--	--	--	--	10	--	--	90	Multi	LB	
0423079	0130-AB 06 A-FT	2	2	--	--	--	--	--	--	--	--	98	Black	LB	
0423080	0130-AB 06 B-FT	2	2	--	--	--	--	--	--	--	--	98	Black	LB	
0423081	0130-AB 06 C-FT	2	2	--	--	--	--	--	--	--	--	98	Black	LB	
0423082	0130-AB 06 A-M	4	4	--	--	--	--	--	TR	--	--	96	Black	LB	
0423083	0130-AB 06 B-M	3	3	--	--	--	--	--	--	--	--	97	Black	LB	
0423084	0130-AB 06 C-M	4	4	--	--	--	--	--	--	--	--	96	Black	LB	
0423085	0130-AB 07 A	NAD	--	--	--	--	--	--	--	--	--	100	Brown	LB	
0423086	0130-AB 07 B	NAD	--	--	--	--	--	--	--	--	--	100	Brown	LB	
0423087	0130-AB 07 C	NAD	--	--	--	--	--	--	--	--	--	100	Brown	LB	
0423088	0130-AB 08 A	NAD	--	--	--	--	40	--	--	--	--	60	Off-White	LB	
0423089	0130-AB 08 B	NAD	--	--	--	--	40	--	--	--	--	60	White	LB	
0423090	0130-AB 08 C	NAD	--	--	--	--	40	--	--	--	--	60	Off-White	LB	

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NVLAP
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AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122701
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	219 Barnum Road, MA Ayer, MA	**Date Analyzed:**	2/9/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**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	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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CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122701
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	219 Barnum Road, MA Ayer, MA	**Date Analyzed:**	02/09/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	11-Feb-04
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
0423043	0130 LA 01	Flame	Air	1036	N/A	2.90	ug/m³	< 2.9	ug/m³	
0423044	0130 LA 02	Flame	Air	1008	N/A	2.98	ug/m³	< 3	ug/m³	
0423045	0130 LA 03	Flame	Air Blank	0	N/A	3.00	ug/m³	< 3	ug	
0423046	0130 LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.011	%Pb	
0423047	0130 LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.0098	%Pb	
0423048	0130 LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.0095	%Pb	
0423049	0130-LW 01	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0423050	0130-LW 02	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0423051	0130-LW 03	Flame	Wipe	****	1.000	12.00	ug/ft²	310	ug/ft²	
0423052	0130-LW 04	Flame	Wipe	****	1.000	12.00	ug/ft²	19	ug/ft²	
0423053	0130-LW 05	Flame	Wipe	****	1.000	12.00	ug/ft²	17	ug/ft²	
0423054	0130-LW 06	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0423055	0130-LW 07	Flame	Wipe	****	1.000	12.00	ug/ft²	79	ug/ft²	
0423056	0130-LW 08	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0423057	0130-LW 09	Flame	Wipe	****	1.000	12.00	ug/ft²	35	ug/ft²	
0423058	0130-LW 10	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0423059	0130-LW 11	Flame	Wipe	****	1.000	12.00	ug/ft²	17	ug/ft²	
0423060	0130-LW BLANK	Flame	Wipe Blank	****	N/A	12.00	ug	130	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
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AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122701
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	219 Barnum Road, MA Ayer, MA	**Date Analyzed:**	02/09/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	11-Feb-04

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)

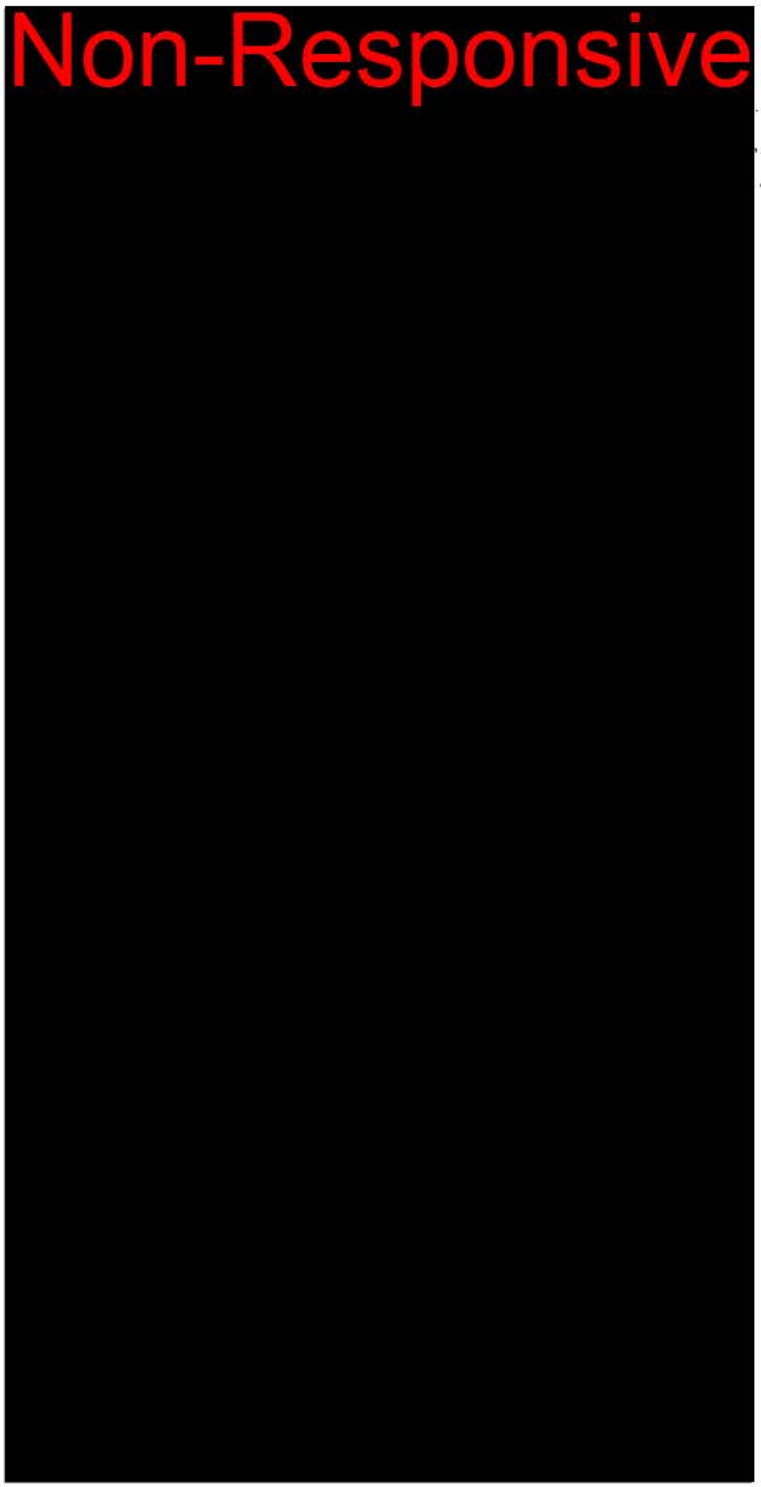
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

[redacted] Non-Responsive

Analyst: [redacted] ical Manager: [redacted]

APPENDIX E

TRAINING CERTIFICATES


Non-Responsive

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 as:

Asbestos Inspector Refresher

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

April 11, 2003
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

03518010625349
Certificate Number

April 10, 2004
Expiration Date

[redacted]

APPENDIX F

PHOTOGRAPHS

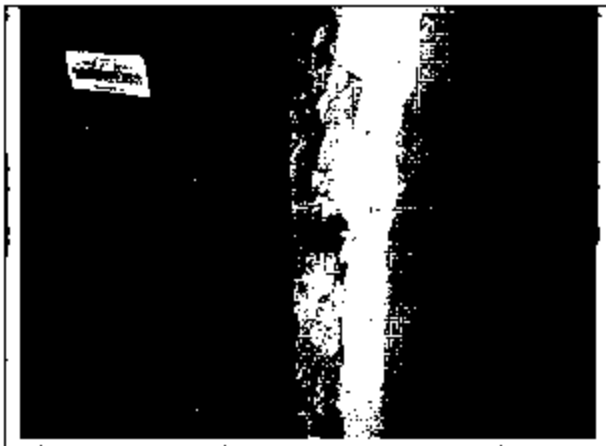


Photo 3446: Boiler Room - Damaged asbestos-containing boiler insulation

Photo 3447: Boiler Room Asbestos-containing boiler insulation debris on floor

Photo 3452: Kitchen #17 – Damaged asbestos-containing floor tile

Photo 3453: Hall #18 – Water damaged ceiling and wall

Photo 3456: Office #21 – Damaged asbestos-containing floor tile

Photo 3458: Utilities Room #4 – Obstructed electrical panel

Photo 3472: Office #3 – Computer work station

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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.

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.

Prepared for:
National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
Havre De Grace, Maryland




Industrial Hygiene Survey
for MAARNG – Ayer Readiness Center
45 Barnum Road
Ayer, Massachusetts 01434

AECOM Environment
October 2010
Document No.: 60159721/Ayer Readiness Center

Prepared for:
National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
Havre De Grace, Maryland

Industrial Hygiene Survey
for MAARNG – Ayer Readiness Center
45 Barnum Road
Ayer, Massachusetts 01434

Non-Responsive

Industrial Hygienist

Non-Responsive

Project Manager

Non-Responsive

Section Manager – EHS Management

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AECOM Environment
October 2010
Document No.: 60159721/Ayer Readiness Center

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Executive Summary

On August 16, 2010, AECOM Environment conducted an Industrial Hygiene (IH) survey of the Ayer Readiness Center facility located at 45 Barnum Road in Ayer, Massachusetts. SSG Non-Responsive was the point of contact for the facility, and Non-Responsive, Program Coordinator I, accompanied AECOM during the survey to provide access and information concerning the Ayer Readiness Center operations.

The industrial hygiene survey was generally conducted in accordance with the scope of work as described in the "Statement of Work – Industrial Hygiene Services for National Guard Bureau Industrial Hygiene Region North – Baseline Surveys for Readiness Centers and Administrative Buildings", dated March 2009.

The Ayer Readiness Center is currently staffed by approximately three personnel. The facility is configured as an administrative area and a Drill/Assembly Hall.

Personnel at the facility were undertaking normal daily activities, which are administrative in nature, at the time of the survey.

The activities undertaken during the Industrial Hygiene survey included facility descriptions, lead wipe/air sampling, evaluation of housekeeping, illumination studies, ventilation system evaluation, and a review of the physical building condition.

The Ayer Readiness Center is housed in a one story masonry slab-on grade building constructed in 1964 and consists of approximately 50% administrative space and 50% drill hall.

Lighting levels measured in half of the facility were adequate and the other half were inadequate as per ANSI/IESNA RP-1-2004, Office Lighting, ANSI/IESNA RP-7-2001, Industrial Lighting, and the IESNA Lighting Handbook, 9th Edition, 11 April 2005,

Wipe samples collected throughout the facility indicated lead levels below the ARNG action level with the exception of the former firing range.

There was no suspect mold growth observed at the facility.

The HVAC system in the building consists of a boiler room that feeds radiant heaters throughout the building. There is no HVAC system that provides fresh air from the building exterior in administrative areas. The Drill Hall is equipped with two overhead air handling units. The two units in the Drill Hall were inaccessible at the time of the survey. No information was available regarding fan unit maintenance.

1.0 Facility Description and Operations

The Ayer Readiness Center is an administrative facility within a masonry structure, slab on grade. The building consists of two main sections. The drill hall comprises center portion of the building. This area is finished with painted cinder block walls, an exposed roof deck, and concrete floors. The surrounding section of the building contains office and administrative areas, and is finished with painted cinder block walls, acoustical ceilings, and tile floors.

The primary activity at the Ayer Readiness Center is routine administrative duties and occasional use by units for support and training of soldiers. The Ayer Readiness Center is currently staffed by approximately 3 personnel. No vehicle maintenance activities are undertaken at the facility.

2.0 Sampling in Readiness Centers

2.1.1 Wipe Sampling

Wipe sampling for lead was conducted in the former firing range, drill hall and administrative areas following the OSHA wipe sampling method and using Ghost wipes. Samples were collected in areas that are not frequently cleaned and showed signs of dust whenever possible.

According to site personnel the indoor firing range at the facility was decommissioned August 30 of 2000. The following table presents the results of the lead wipe sampling conducted at the facility.

Table 2-1: Lead Wipe Sample Results

Sample Number	Sample Location	Lead Concentration
ARC-1	Bullet Trap in Former Range	<110 ug/ft^2
ARC-2	Light Fixture in Former Range	<110 ug/ft^2
ARC-3	Former Range Floor	<110 ug/ft^2
ARC-4	Storage Box in Former Range	270 ug/ft^2
ARC-5	Floor Outside of Former Range	<110 ug/ft^2
ARC-6	Duct in Former Range	<110 ug/ft^2
ARC-7	Drill Hall Floor	<110 ug/ft^2
ARC-8	Drill Hall Refrigerator	120 ug/ft^2
ARC-9	Drill Hall Cabinet	<110 ug/ft^2
ARC-10	Kitchen Counter	<110 ug/ft^2
ARC-11	Orderly Room Floor	<110 ug/ft^2
ARC12	Retention Locker	<110 ug/ft^2

The wipe sample collected on top of a storage box indicated detectable levels of lead. Levels detected were above the ARNG action level of 200 ug/ft^2. Laboratory analytical results are presented in Appendix C.

2.1.2 Air Sampling

Ambient air sampling for lead was conducted in two normally occupied areas of the facility.

Table 2-2: Lead Air Sample Results

Sample Number	Sample Location	Lead Concentration
ARC-01A	Drill Hall	<15 ug/m^3
ARC-02A	Orderly Room	<15 ug/m^3

None of the air samples collected indicated the presence of airborne lead above detectable limits. For reference, the OSHA Action Level for lead is 30 ug/m^3 and the Permissible Exposure Limit (PEL) is 50 ug/m^3. Laboratory analytical results are presented in Appendix C.

2.1.3 Asbestos Sampling

AECOM observed damaged, friable suspect asbestos containing debris in readily accessible areas of the boiler room. Pipe and pipe fitting insulation appeared to be generally in fair condition. Straight pipe sections and pipe fittings were observed to be insulated with fiberglass.

AECOM collected 3 samples of the suspect boiler insulation in accordance with 29 CFR 1926.1101. All three samples were found to be asbestos containing as shown in table 2-3. Laboratory reports are included in Appendix C

Other typical miscellaneous building materials observed but not sampled include floor tiles, sheetrock, and joint compound.

Table 2-3: Lead Air Sample Results

Sample Number	Sample Location	% Asbestos
ARC-01B	Boiler	35.85%
ARC-02B	Boiler	43.16%
ARC-03B	Boiler	22.22%

All of the samples collected were above the reference value of 1% per 29 CFR 1926.1101

3.0 Physical Condition of Facility and Personnel Concerns

3.1.1 Lead Based Paint

Interior surfaces of walls are coated with paint. The paint on the walls appeared to be generally in good condition. Concrete flooring was generally tiled or unpainted. AECOM did not observe damaged or peeling paint during this evaluation.

3.1.2 Suspect Asbestos Containing Materials

AECOM observed damaged, friable suspect asbestos containing materials (ACM) in the boiler room of the Ayer Readiness Center during this survey. Thermal system piping is typically covered in ACM or fiberglass insulation with associated fittings in good condition.

Other typical miscellaneous building materials observed but not sampled include floor tiles and associated mastic, cove base and associated mastic, ceiling tiles, and window glazing compound and caulks.

3.1.3 Water Damage/Mold

AECOM did not observe any evidence of water intrusion in the facility during this survey.

3.1.4 Housekeeping

The Ayer Readiness Center was observed to be generally clean and orderly during this assessment. AECOM did not observe dust accumulation on readily accessible horizontal surfaces within areas commonly used in the facility.

3.1.5 Indoor Air Quality/ Ergonomics

The Administration Section contains general office space. The Administration Section is generally utilized by all of the Ayer Readiness Center staff members. No Indoor Air Quality concerns were noted by the Ayer Readiness Center personnel.

Instantaneous real-time reading for carbon monoxide, carbon dioxide, temperature, and relative humidity are presented in the following table. The readings appeared to be within generally accepted guidelines.

Table 3-1: Indoor Air Quality Monitoring Results

Location	Carbon Monoxide (ppm)	Carbon Dioxide (ppm)	Temp (^{o}F)	Relative Humidity (%)
Exterior - Baseline	1.5	388	88.4	69.2
Drill Hall	1.3	448	73.2	72.2

Table 1-3 Guidelines:
Carbon Monoxide: Office/Warehouse Space – 9 ppm based on EPA National Ambient Air Quality Standard.
OSHA Permissible Exposure Limit (PEL) = 50 ppm. ACGIH Threshold Limit value (TLV) = 25, ppm.
Carbon Dioxide: Office Space -Approximately 700 ppm above background (Derived from ASHRAE Standard 62.1-2007). Not Applicable to warehouse and vehicle maintenance bays.
Relative Humidity: Mechanically air-conditioned space – Maximum 65% (Derived from ASHRAE Standard 62.1-2007 – 5.10.1).
Temperature: Winter (clothing insulation = 1.0 clo) Relative humidity 30-60% - Temp - 68 – 75°F
Summer Temp - 73 – 79°F. (Derived from ASHRAE Standard 55-2004)

Ayer Readiness Center personnel did not report any ergonomics issues or concerns. Office furniture and accessories designed to promote ergonomically correct behaviors were observed.

4.0 Ventilation and HVAC System

4.1.1 Ventilation Systems and Potential for Contamination of Clean Air Sources

Potential for contamination of clean air sources was not observed in the facility.

The Ayer Readiness Center is heated by a radiant heating system fed by a boiler located in the boiler room that is adjacent to the drill hall. Supply and return air is not provided by mechanical means. Outdoor air is provided in the building through open windows and doors.

Two air handling units are located in the overhead space of the drill hall, but the units were inaccessible and site personnel could not provide information on the use or status of the system. The fans were not observed in operation during the survey.

4.1.2 HVAC Maintenance

There was no maintenance schedule associated with an active ventilation system.

5.0 Lighting

Lighting levels in all areas were measured utilizing a Cal-Light 400 light meter that displays lighting levels in foot-candles. Lighting levels were sporadic throughout the facility with inadequate lighting in approximately half of the areas measured.

Table 5-1: Light Survey

Location	Results – (Foot candles)	Met Standard (Y/N)	Standard*
Drill Shed	16.1	Y	10
Orderly Room	93.8	Y	50
Commander Office	35.9	N	50
Recruiting	38.3	N	50
Retention	40.1	N	50
Training Room	36.2	Y	30
Mess Hall	69.2	Y	10
Kitchen	35.4	Y	10
Ladies' Room	6.2	Y	5
Men's Restroom	9.2	Y	5
Supply Room	9.1	Y	5
Boiler Room	16.2	N	30
1st SGT Office	38.6	N	50
Armorer	11.6	N	50
Office Lighting (ANSI/IESNA RP-1-04) and Industrial Lighting Facilities (ANSI RP-7-01)			

6.0 Evaluation of Attached Garage

There is no garage associated with the Ayer Readiness Center.

7.0 Conclusions and Limitations

AECOM has conducted this survey in accordance with applicable OSHA methods and standard industrial hygiene practice. The following conclusions were based on the observations and assessments of activities that occurred during the on-site evaluation:

Housekeeping is performed regularly at the Ayer Readiness Center, and AECOM did observe damaged, suspect asbestos containing boiler insulation during the evaluation. AECOM collected samples of this material and had it analyzed by AMA Laboratories. Analysis showed this material to be ACM containing.

There was no evidence of water intrusion or suspect mold growth at Ayer Readiness Center.

Lighting levels in half of the areas measured were out of compliance with ANSI/IESNA guideline levels.

Air samples collected and analyzed did not indicate quantifiable levels of airborne lead.

Wipe samples collected in various locations throughout the building did not indicate levels of lead on surfaces in excess of the ARNG action level except on the storage box in the former firing range. Site personnel informed AECOM that the range was fully abated of lead on August 30th, 2000.

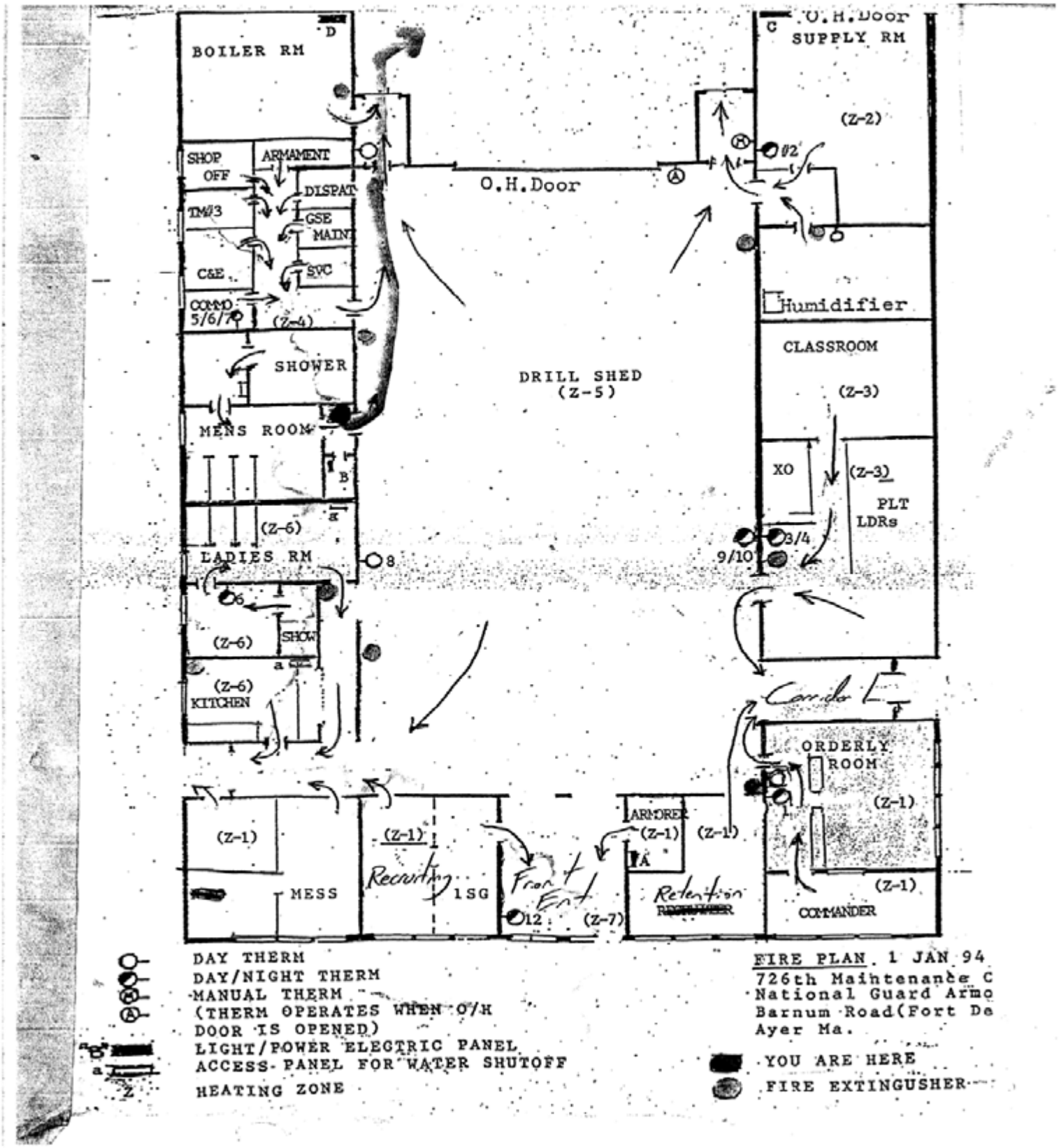
AECOM provided these services consistent with the level and skill ordinarily exercised by members of the profession currently providing similar services under similar circumstances at the time the services were provided. This statement is in lieu of other statements either expressed or implied. This report is intended for the sole use of National Guard Bureau – Army National Guard. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document, the findings, conclusions, or recommendations is at the risk of said user.

As with all such surveys, the results of the sampling represent conditions found on the date of the survey and may not represent conditions found at other times. Additionally, this survey was limited with respect to the specific parameters indicated above and should not be construed to be a comprehensive evaluation or a definitive representation of conditions within the facility. The information presented in this report is intended to be used as a guide to evaluate the need for further investigation or the need for modifications to the processes or procedures surveyed.

The Client recognizes and agrees that all testing and remediation methods have reliability limitations, no method nor number of sampling locations can guarantee that a condition will be discovered within the performance of the services as authorized by the Client. Additionally, the passage of time may result in a change in the environmental characteristics at this site. This report does not warrant against future operations or conditions that could affect the recommendations made. The results, findings, conclusions, and recommendations expressed in this report are based only on conditions that were observed during AECOM's inspection of the site.

Appendix A

Ayer Readiness Center Facility Layout



Appendix B

Ayer Readiness Center Photographs

Photograph 1

Building Exterior - Front

Photograph 2

Building Exterior - Rear

Photograph 3
 3 Missing Ceiling Tile in Office Space

Photograph 4
 Drill Hall

Photograph 5

Ventilation Unit in Drill Hall

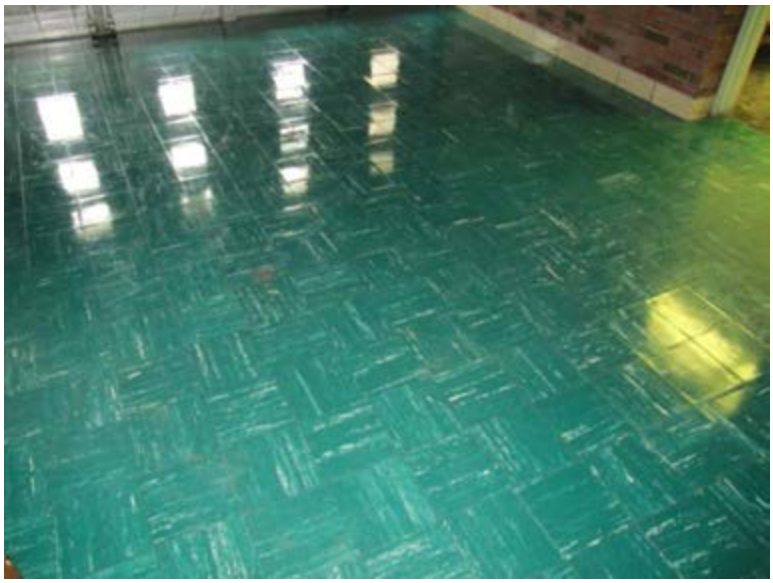
Photograph 6

Former Bullet Trap

Photograph 7

Former Firing Range

Photograph 8



Asbestos Floor Tile in Lobby

Photograph 9
 Typical Pipe Insulation
Photograph 10
 Boiler Room and ACM Insulation

Photograph 11
 Flammable Storage Cabinets

Photograph 12
 Lead Swipe Sample In Former Range

Photograph 13

Kitchen Area

Appendix C

Analytical Results

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NY ELAP
10920

Client:	National Guard Bureau	Job Name:	Ayer Readiness Center	Chain Of Custody:	508622
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	Job Location:	Ayer, MA	Date Analyzed:	8/30/2010
	Havre de Grace, Maryland 21078	Job Number:	Not Provided	Person Submitting:	[redacted]
		P.O. Number:	W912K5-09-A-0003		
Attention:	[redacted]				

Summary of Point Count Results by 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	Point Count Method	Comments
1073175	ARC-01 B	35.85%	7.55%	28.30%	--	--	--	--	--	--	--	64.15%	White	Homogeneous	STA	
1073176	ARC-02 B	43.16%	38.95%	4.21%	--	--	--	--	--	--	--	56.84%	Multi	Homogeneous	STA	
1073177	ARC-03 B	22.22%	22.22%	--	--	--	--	--	--	--	--	77.78%	Gray	Homogeneous	STA	

* 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.

** 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 and/or NY State ELAP 198.1

EPA - 400 Point Count STA - Stratified Point Count SNO - Scanning Negative Option

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

Technical Director [redacted] Analyst(s) [redacted]

An AIHA (#100470), NVLAP (101143-0), and NY ELAP (#10920) Accredited Laboratory

4475 Forbes Blvd. · Lanham, MD, 20706 · (301) 459-2640 · Toll Free (800) 346-0961 · Fax (301) 459-2643

OW (410)247-2024 15D02 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) 346-0951 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) **508622**

1 of 3

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-A\N-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: Ayer RC
2. Job Location: Ayer, MA
3. Job # P.O. #: W912K6-09-A-0003
4. Contact Pers[redacted]
5. Submitted by[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 +
☐ 2 Day Date Due:
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Inc[redacted] with Report
☒ Em[redacted] @AECOM.com
☐ Fax [redacted] @us.army.mil
☐ Ver[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 3 (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) 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 Trap/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Specie (Media) (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	PAINT CHIP AND OTHER	SPORE TRAP	TAPE	SWAB
ARC-01	Bullet Trap	8/16/10	N/A	16in²				X								X
ARC-02	Light Fixture							X								X
ARC-03	Floor-Range							X								X
ARC-04	Storage Box							X								X
ARC-05	Floor-Range Ext							X								X
ARC-06	Duct-Range							X								X
ARC-07	Dr. II Hall Floor							X								X
ARC-08	Fridge							X								X
ARC-09	Cabinet							X								X
ARC-10	Kitchen							X								X
ARC-11	Utility Ro-Floor							X								X
ARC-12	Reduction-Locker	✓	✓	✓				X								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: 8/30/10 @ Via: Fed[redacted]
2. Date/Time Analyzed: 8/30/10 @
3. Results Reported To: [redacted]
4. Comments:

[redacted] Date: 8/30/10 Time: Initials: PC

OW (410) 247-2924 159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires)

pg 2/3

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4. Contact Pers[redacted]
5. Submitted by[redacted]

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: ____ ☐ 24 Hours Time Due: ____ Comments: ____	☐ Immediate ☐ Next Day ☐ 2 Day ☐ 3 Day ☒ 5 Day + Date Due: ____ ☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	☒ Incl[redacted]h Report; ☒ Em[redacted] AECOM.Com; ☐ Fax[redacted] us.army.mil; ☐ Verb[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
☐ EPA600 – 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 ____) ____ (QTY)
☒ Pb Air 2 (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	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
ARC-01A	Drill Hall	8/16/10	200					X		X							Date/Time: Contact: By:
ARC-02A	Orderly Room	8/16/10	200					X		X							
																	Date/Time: Contact: By:
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: ___/___/___ @ ___ Via: ____ By (Print): ____ Sign: ____
2. Date/Time Analyzed: ___/___/___ @ ___ By (Print): ____ Sign: ____
3. Results Reported To: ____ Via: ____ Date: ___/___/___ Time: ____ Initials: ____
4. Comments: ____

BEST AVAILABLE COPY

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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) 3/3

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: AVER RC
2. Job Location: AYER, MA
3. Job #: P.O. #: W912K6-09-A-0003
4. Contact Person: [redacted]
5. Submitted by: [redacted]

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 ☐ 1 Day	☒ Include COC/Field Data Sheets with Report
☐ 24 Hours Time Due: ____	☐ Next Day ☒ Day +	☒ Ema[redacted] @AECOM.com
Comments: ____	☐ 2 Day Date Due: ____	☐ Fax: [redacted] @us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ Verb[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 3 (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 ____) ____ (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					ANALYSIS						MATRIX						CLIENT CONTACT
CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	(LABORATORY STAFF ONLY)
AYCC-01B	Boiler	5/16/10					X				X						Date/Time: Contact: By:
02B	Boiler	"					X				X						
" 03B	Boiler	"					X				X						
																	Date/Time: Contact: By:
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: ____ / ____ / ____ @ ____ Via: ____ By (Print): ____ Sign: ____
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ Via: ____ Date: ____ / ____ / ____ Time: ____ Initials: ____
4. Comments: ____

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CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY
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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAP #100470

NY ELAP 10920

Client:	National Guard Bureau	**Job Name:**	Ayer Readiness Center	**Chain Of Custody:**	508622
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Ayer, MA	**Date Submitted:**	8/23/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/30/2010 **Report Date:** 8/30/2010

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		Total ug	Final Result		Comments
1073161	ARC-01	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
1073162	ARC-02	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
1073163	ARC-03	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
1073164	ARC-04	Flame	Wipe	****	0.111	110	ug/ft²	29	270	ug/ft²	
1073165	ARC-05	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
1073166	ARC-06	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
1073167	ARC-07	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
1073168	ARC-08	Flame	Wipe	****	0.111	110	ug/ft²	14	120	ug/ft²	
1073169	ARC-09	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
1073170	ARC-10	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
1073171	ARC-11	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
1073172	ARC-12	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
1073173	ARC-01 A	Flame	Air	200	N/A	15	ug/m³	<3	<15	ug/m³	
1073174	ARC-02 A	Flame	Air	200	N/A	15	ug/m³	<3	<15	ug/m³	

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Ayer Readiness Center	**Chain Of Custody:**	508622		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Ayer, MA	**Date Submitted:**	8/23/2010		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/30/2010	**Report Date:**	8/30/2010
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	Total ug	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) 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 sampes.

NY ELAP accreditation applies only to paint chip, wipe, and soil samples.

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted] Non-Responsive

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(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquiries) **508622**

1 of 3

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: Ayer RC
2. Job Location: Ayer MA
3. Job #:
PO #: W912K6-09-A-0003
4. Contact Per [redacted]
5. Submitted b

Reporting Information (Results will be provid

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: ☐ 24 Hours Time Due: Comments:	☐ Immediate ☐ Next Day ☐ 2 Day ☐ 3 Day ☒ 5 Day + Date Due: ☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	☒ Inc [redacted] with Report ☒ Em [redacted] AECOM.com ☐ Fax [redacted] us.army.mil ☐ Ver [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 3 (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. ts/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) 12 (QTY)
☐ Pb Air 2 (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 Trap/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Specie (Media) (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WIPE	SOIL	TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
ARC-01	Bullet Trap	8/16/10	N/A	16in²				X									X	Date/Time: Contact: By:
ARC-02	Light Fixture							X									X	
ARC-03	Floor-Range							X									X	
ARC-04	Storage Box							X									X	
ARC-05	Floor-Range Ext							X									X	Date/Time: Contact: By:
ARC-06	Dust-Range							X									X	
ARC-07	Drill Hall Floor							X									X	
ARC-08	Fridge							X									X	
ARC-09	Cabinet							X									X	Date/Time: Contact: By:
ARC-10	Kitchen							X									X	
ARC-11	Outside Range Floor							X									X	
ARC-12	Reduction Locker							X									X	

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: Sign:
2. Date/Time Analyzed: 8 / 30 / 10 @ By (Print): [redacted] Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

AMA Analytical Services, Inc.
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(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 508622 pg 2/3

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: Ayer RC
2. Job Location: Ayer, MA
3. Job #: P.O. #: W912K6-09-A-0003
4. Contact Perso [redacted]
5. Submitted by: [redacted]

Reporting Information (Results will be provided [redacted])

AFTER HOURS (must be pre-sheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Include COC/Full Data Sheets with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	☒ [redacted] AECOM.com
Comments:	☐ 2 Day Date Due:	☐ [redacted] us.army.mil
	☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	☐ [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/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) (QTY)
- ☒ Pb Air 2 (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	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SWAB/TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
ARC-01A	Duty Hall	3/16/10	200					X		X							Date/Time: Contact: By:
ARC-02A	Orderly Room	3/16/10	200					X		X							
																	Date/Time: Contact: By:
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

OWI (410) 247-2004 159202 210 REV. 6.08

508622
3/3

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(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: AYER RC
2. Job Location: AYER, MA
3. Job #: PO #: W912K6-08-A-0003
4. Contact [redacted]
5. Submitte[redacted]

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	☒ Include COC/Field Data Sheets with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	☒ [redacted] aecom.com
Comments:	☐ 2 Day Date Due:	☐ [redacted] us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ [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) (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	MATRIX: DUST	WASTE AQUEOUS LIQUID	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
A2C.01B	Boiler	8/16/10					X				X						Date/Time: Contact: By:
02B	Boiler						X				X						
03B	Boiler						X				X						
																	Date/Time: Contact: By:
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

Appendix D

References

References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current Ed. http://www.osha.gov/comp-links.html

2. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998. http://www.dtic.mil/whs/directives/corres/pdf/i60551_081998/i60551p.pdf

3. Army Regulation (AR) 11-34, The Army Respiratory Protection Program, 15 February 1990. http://www.usapa.army.mil/pdffiles/r11_34.pdf

4. AR 40-5, Medical Service, Preventive Medicine, 25 May 2007. http://www.usapa.army.mil/pdffiles/r40_5.pdf

5. AR 385-10, The Army Safety Program, 23 August 2007. http://www.usapa.army.mil/pdffiles/r385_10.pdf

6. Department of the Army Pamphlet (DA PAM) 40-501, Medical Services, Hearing Conservation Program, 10 December 1998. http://www.usapa.army.mil/pdffiles/p40_501.pdf

7. AR 40-11, Preventive Medicine, 22 July 2005. http://www.army.mil/usapa/epubs/pdf/p40_11.pdf

8. DA PAM 40-503, Medical Services, Industrial Hygiene Program, 30 October 2000. http://www.usapa.army.mil/pdffiles/p40_503.pdf

9. UFC 3-410-01FA, Heating, Ventilating, and Air Conditioning, 15 May 2003. http://www.wbdg.org/ccb/DOD/UFC/ufc_3_410_01fa.pdf

10. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current Ed.

11. Industrial Ventilation – A Manual of Recommended Practice for Design, ACGIH, current Ed.

12. American National Standards Institute (ANSI) Z358.1-2004, Emergency Eyewash and Shower Equipment.

13. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) 62.1-2007, Ventilation for Acceptable Indoor Air Quality.

14. RP-1-2004, Office Lighting, ANSI/IESNA.

15. RP-7-2001, Industrial Lighting, ANSI/IESNA, change 20 July 2004.

16. Unified Facilities Criteria, (UFC) 3-410-01FA, Heating, Ventilating, and Air Conditioning, 15 May 2003, including change 3, Aug. 03.

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
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
45 BARNUM ROAD
AYER, MA 01434

June 17, 2013
PN: 39743799

Non-Responsive

Director, Industrial Hygiene Services

Non-Responsive

Project Manager

TABLE OF CONTENTS

APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
45 BARNUM RD., AYER, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in several locations tested.	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, arm rests and keyboards. Several wheeled chairs with four casters were noted.	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
Water Intrusion		
Facility personnel noted leaks in the Drill Hall ceiling above the men's latrine. Water staining was noted on ceiling tiles in the admin area.	The source of the water intrusion should be identified and repaired. (ACGIH – Guidelines for the Assessment of Bio-aerosols in the Indoor Environment).	RAC 3
Lead		
One of the 10 lead wipe samples indicated elevated lead levels.	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
Asbestos		
Presumed asbestos-containing floor tiles and associated mastic were observed throughout the facility; an Asbestos Operation and Maintenance Program was not available on-Site.	Develop a site-specific asbestos operations and maintenance program for management of asbestos-containing materials in place as required by OSHA 29 CFR 1910.1001(j)(2).	RAC 4
PPE		
Hazard assessments have not been conducted to determine whether personal protective equipment is 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 4

Findings	Recommendations	Risk Assessment Code (RAC)
Ladders		
Ladders were observed not properly stored in the first floor classroom and basement boiler room.	Ladders not in use shall be properly stored in a vertical position fastened to walls. (29 CFR 1910.25 (c)(2)(i)).	RAC 4
Housekeeping		
Storage areas were found to be somewhat unorganized at the time of URS' site visit.	All places of employment, passageways, storerooms and service rooms shall be kept clean and orderly and in a sanitary condition. (29 CFR 1910.22 (a)(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 Readiness Center in Ayer, Massachusetts.

URS representative, Mr. Non-Responsive, conducted the Industrial Hygiene Survey on May 1, 2013. 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 mapping.

The Ayer Readiness Center is a one-story brick building, consisting of offices, classrooms, a supply area, a mess hall, gender separate bathrooms, storage rooms, a kitchen, Assembly Hall and a former Indoor Firing Range. A layout of the Readiness Center is provided in Appendix A.

GENERAL: Walkways in storage areas were cluttered at the time of this survey. Ladders were observed not properly stored in the boiler room. Water staining was observed on ceiling tiles throughout the facility. Storage areas were found to be somewhat unorganized at the time of URS' site visit.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in several of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress work areas must be lighted by at least the minimum light intensities.

LEAD: One of ten wipe samples collected in the Readiness Center was found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office. A lead paint sample was not found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

ASBESTOS: Presumed asbestos-containing floor tiles and associated mastic were identified during this survey, however no Asbestos Operations and Maintenance Program was found on site. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. 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, keyboards, and desks were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker. Wheeled chairs with four casters were not identified in the facility

NOISE: Area noise monitoring levels in the Readiness Center were determined to be below the OSHA permissible exposure limit (PEL) and the Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and for conducting administrative functions. The building includes offices, classrooms, a supply area, gender separate bathrooms, storage rooms, a mess hall, a kitchen, Assembly Hall and a former Indoor Firing Range.

The Readiness Center storage areas were found to be somewhat cluttered and unorganized at the time of URS' site visit.

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 Readiness Center. Interior carbon dioxide concentrations were found to be between 498 and 706 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (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 but is typically 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 402 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below

1102 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 Readiness Center was measured between 0.0 ppm and 0.1 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-Trak 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.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 28.7%, which was within the guideline of less than 65% recommended by ASHRAE.

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.

The average temperature inside the Readiness Center was, 71.7 °F, which was within the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Readiness Center 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)
Small admin office, workstation	Admin	110.9	50
Admin, desk - Non-Responsive	Admin	92.2	50
Admin, workstation	Admin	98.1	50
Commander's office - desk	Admin	85.0	50
Kitchen counter	Break Room	60.9	10
Classroom table	Admin	**23.1**	50
Supply, workstation	Admin	**16.7**	50

FC – Foot candles

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in two of the office/administrative locations.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center 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 Readiness Center

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Admin office, middle window sill	Ayer RC Wipe-01	0.108	<110	200

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Commander's office, left window sill	Ayer RC Wipe-02	0.108	<110	200
Classroom/ Mess Hall (former Indoor Firing Range)	Ayer RC Wipe-03	0.108	<110	200
Unit room, top of wooden shelf by windows	Ayer RC Wipe-04	0.108	<110	200
Kitchen, window sill	Ayer RC Wipe-05	0.108	<110	200
Supply Room 1, top of white file cabinet	Ayer RC Wipe-06	0.108	<110	200
Supply Room 2, floor in front of sliding door	Ayer RC Wipe-07	0.108	<110	200
Boiler Room, top of silver unit attached to boiler	Ayer RC Wipe-08	0.108	**420**	200
Drill Hall, top of mail boxes	Ayer RC Wipe-09	0.108	<110	200
Storage (former Indoor Firing Range), floor below boxes	Ayer RC Wipe-10	0.108	<110	200

ft^2 – Square foot
$\mu g/ft^2$ – Micrograms per square foot

One of the ten surface dust level measurements was found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

One paint chip sample was collected from an area of peeling paint and was analyzed for lead content. The analytical report from AMA is contained in Appendix C.

Table 2-3
Lead Content in Painted Surfaces

Paint Location	Lead Concentration (Percent Weight)	HUD Lead-Based Quantity (Percent Weight)
Gray paint, walls, drill hall	<0.01	0.5

On the day of the survey, the paint chip sample was not found to have a lead content above the HUD criteria for determination of paint as lead-based.

2.2.7 Asbestos

No damaged, friable suspect material was identified during this survey for sample collection.

Presumed asbestos-containing floor tiles and associated mastic were identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

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, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Area noise dosimetry was conducted within the administrative office area. Area exposures were measured using a data-logging Spark 703+ Noise Dosimeter. Area noise dosimetry results indicated that, on the day of the survey, workers were not exposed to noise levels above the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 decibels, A scale (dBA)/8-hour day. Table 2-4 indicates the individual monitored, the tasks performed and noise exposures.

Table 2-4
Noise Dosimetry Data

Location	Task	Sample Duration (Min.)	Monitoring Result TWA (dBA)*	Hearing Protection
Admin Office	Administrative	411	56.7	N/A

* The calculated 8-hour, time-weighted average (TWA) noise exposure in dBA. The OSHA PEL for noise exposure is 90 dBA. DoDI has established an employee exposure level of 85 dBA for requirement of a hearing conservation program.
Min. - Minutes

2.5 Personal Protective Equipment

Personal protective equipment was orderly and readily available to employees in the Readiness Center. Personal protective equipment included hard hats, safety glasses, ear plugs and nitrile gloves.

3.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

3.1 Confined Spaces

A written confined spaces program was identified at this facility but is not required for this site.

3.2 Hearing Conservation

A written hearing conservation program was identified on site. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise dosimetry results and a review of normal site operations, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was identified on site. No operations were observed by URS that would require the use of respiratory protection.

3.4 Hazard Communication

A site-specific hazard communication program was identified on site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey. Universal waste logs did not accompany a universal waste container in the boiler room.

3.5 Personal Protective Equipment

A written personal protective equipment program was identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site. Since suspect asbestos-containing materials were observed, an operations and maintenance program is required for this site.

3.7 Safety

Walkways in storage areas were cluttered at the time of this survey. Ladders were observed not properly stored in the boiler room. Water staining was observed on ceiling tiles throughout the facility.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

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, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15

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

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

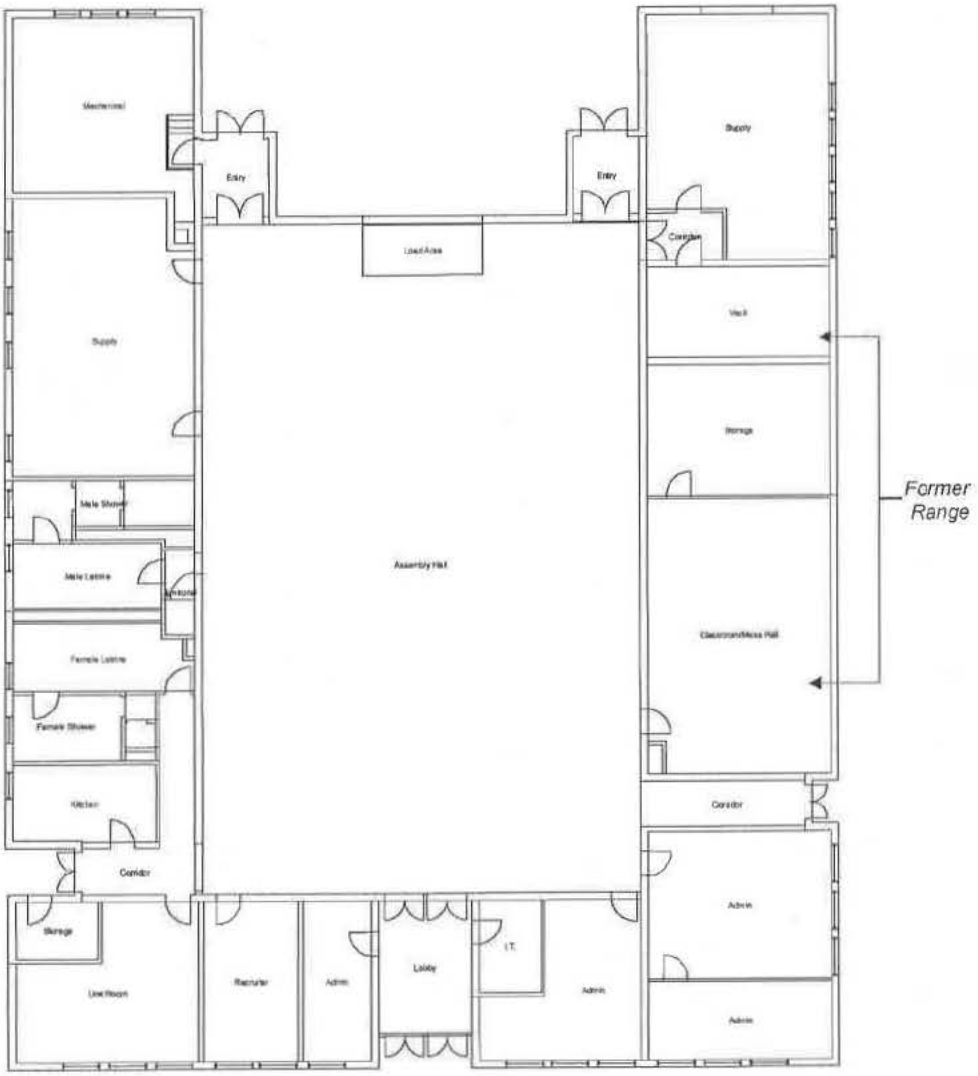
OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

APPENDIX A

SHOP DRAWING

Ayer - 25A15
Floor Plan

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE



0 5 10 20 30 40 50
Feet

0 5 10 20
Meters

1:200
Massachusetts NAD 83

APPENDIX B

PERSONNEL LIST

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APPENDIX C

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515814
Address:	301-JH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	45 Barnum Road, Ayer, MA	**Date Submitted:**	5/6/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Ayer RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/13/2013 **Report Date:** 5/13/2013

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
13059833	AyerRC Wipe 01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13059834	AyerRC Wipe 02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13059835	AyerRC Wipe 03	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13059836	AyerRC Wipe 04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13059837	AyerRC Wipe 05	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13059838	AyerRC Wipe 06	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13059839	AyerRC Wipe 07	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13059840	AyerRC Wipe 08	Flame	Wipe	****	0.108	110	ug/ft^2	45	420	ug/ft^2	
13059841	AyerRC Wipe 09	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13059842	AyerRC Wipe 10	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13059843	AyerRC Wipe FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13059844	AyerRC LP 01	Flame	Paint Chip	****	N/A	0.01	%Pb		<0.01	%Pb	

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:**	MA ARNG	**Chain Of Custody:**	515814
Address:	301-lH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	45 Barnum Road, Ayer, MA	**Date Submitted:**	5/6/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Ayer RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/13/2013 **Report Date:** 5/13/2013

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.

Analy Non-Responsive

Technical Manager: Non-Responsive

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OWI (410) 247-2024

159202 210 REV. 6.06

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) 515814

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: MA IARNG
2. Job Location: 45 Barnum Rd, Ayer, MA
3. Job #: Ayer RC P.O. #: W912K6-09-A-0003
4. Contact Person [redacted]
5. Submitted by [redacted] phone: 401-829-4985

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: 5/13/13
☐ 2 Day
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Inclu[redacted]th Report
☒ [redacted] urs.com
☐ Fax: [redacted] us.army.mil
☐ Verb[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 1 (QTY)
☒ Pb Dust Wipe (wipe type Ghost) 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)

SAMPLE INFORMATION / ANALYSIS / MATRIX

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Ayer RC wipe 01	admin	5/1/13		100cm²				X				X				
Ayer RC wipe 02	↓	↓		↓				X				X				
Ayer RC wipe 03								X				X				
Ayer RC wipe 04								X				X				
Ayer RC wipe 05								X				X				
Ayer RC wipe 06	Maintenance							X				X				
Ayer RC wipe 07	↓							X				X				
Ayer RC wipe 08								X				X				
Ayer RC wipe 09								X				X				
Ayer RC wipe 10								X				X				
Ayer RC wipe FB	Field Blank							X				X				
Ayer RC LP 01	Drill Hall - Gray							X			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: 5 / 6 / 13 @ ____ Via: FedEx By (Print): [redacted] Si[redacted]
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ Via: ____ Date: ____ / ____ / ____
4. Comments: 7940 6054 8931

APPENDIX D

PHOTOGRAPHIC LOG

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Ayer RC	45 Barnum Rd, Ayer, MA	39743799

Photo No.	Date:
1	5/1/13

Description:

Entrance area near boiler room missing entrance mats.

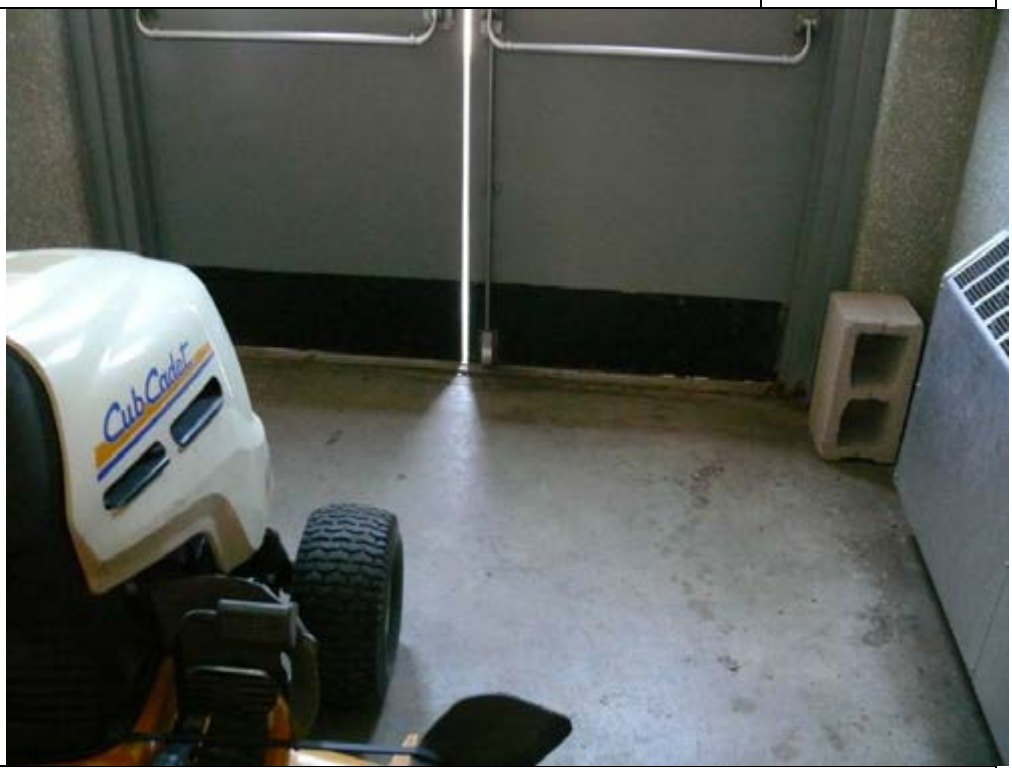


Photo No.	Date:
2	5/1/13

Description:

Improperly stored ladders in Boiler Room.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Ayer RC	45 Barnum Rd, Ayer, MA	39743799

Photo No.	Date:
3	5/1/13

Description:

Universal Hazardous Waste container in boiler room does not have accompanying waste log.

Photo No.	Date:
4	5/1/13

Description:

Water damaged ceiling tiles in the main admin office area.

BEST AVAILABLE COPY

APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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

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 µg/ft^2 on floors and 250 µg/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.

Industrial Hygiene Survey

Massachusetts Army National Guard (MA ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Bourne Readiness Center

10 Armory Road
Bourne, MA 02532-5595

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

Survey Date: August 17, 2010
Report Date: September 24, 2010

AEI Project #: J10-515 3d MA Bourne RC

_____

Non-Responsive

Industrial Hygienist

Table of Contents

List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Readiness Center located at 10 Armory Road, Bourne, MA, 02532-5595. Non-Responsive performed the evaluation on August 17, 2010. The point of contact for the facility was Sergeant 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) evaluations of operations including operation description, 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:

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.

Lead in Air Samples: Lead in air samples to determine if any airborne contamination of lead existed in the facility were not collected at the Bourne Readiness Center due to sample pump malfunction.

Paint Chip and Wipe Samples for Lead Contamination: Two wipe samples collected in the former firing range were above the National Guard criteria for lead contamination (200 µg/ft^2). Samples above the criteria were collected from the bullet trap and the middle of the floor of a former indoor firing range. Reported lead concentrations of these two samples were 18,000 µg/ft^2 and 1,100 µg/ft^2 respectively. Samples ranged from 5.5 to 90 times the National Guard criteria. The history of the indoor firing range was not known to current employees at the Readiness Center. It appeared not to have been converted in accordance with NG PAM 420-15 and it was being used as storage. Peeling paint was observed on the walls and ceiling of the boiler room; therefore, two paint chip samples were collected. All paint chip samples were below regulatory limits of 0.5% lead by weight.

Visual Inspection for Damaged Asbestos-Containing Materials: No damaged suspect asbestos-containing materials were observed at the Bourne Readiness Center.

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. Staining caused by water intrusion was observed in the supply room, as well as, the ceiling of the drill hall. No mold growth was observed at the Bourne facility.

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: The evaluation indicated that there are some illumination deficiencies in the three offices (rooms 6, 16 and 20 on the drawing) and the boiler room. The illumination measurements indoors ranged from a low of 6.1 foot candles (fc) to a high of 91 fc.

Indoor Air Quality: Temperatures and relative humidity measurements were outside the acceptable range in most of the facility. These results are not unexpected due to outdoor

conditions on the day of the survey and the lack of air conditioning in most of the facility. Indoor levels of CO_2 ranged from 310 to 517 parts per million (ppm) and outdoor CO_2 levels were approximately 320 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange. Indoor levels of CO ranged from 0.1 to1.0 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Massachusetts Army National Guard (MA ARNG) Readiness Center located at 10 Armory Road, Bourne, MA, 02532-5595. Non-Responsive performed the evaluation on August 17, 2010. The point of contact for the facility was Sergeant 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 Bourne Readiness Center is staffed with 4 administrative 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 Bourne 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 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 Bourne facility consists exclusively of supply and administrative duties. No maintenance of vehicles, painting of equipment or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer 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

Heat is supplied to the facility through a boiler located in the boiler room and overhead heaters in the drill hall. The boiler certificate for the Bourne facility is expired and is not up to date. Any air conditioning provided to the building is through window air conditioning units. No local ventilation systems were present at 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 peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices. Lighting and indoor air quality measurements were taken in all areas of the facility as well.

Lead in Air Samples

Lead in air samples to determine if any airborne contamination of lead existed in the facility were not collected at the Ware Readiness Center due to sample pump malfunction.

Paint Chip and Dust Wipe Samples for Lead Contamination

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 10cm x 10cm templates. Wipe samples for surface dust were collected in 15 locations. The Environmental Protection Agency (EPA) and the Commonwealth of Massachusetts 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 Center for Health Promotion and Preventive Medicine (USACHPPM) 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 Aerosol Monitoring and Analysis Analytical Services, Inc. (AMA) for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Two wipe samples collected in the former firing range were above the National Guard criteria for lead contamination (200 µg/ft^2). The history of the indoor firing range was not known to current employees at the Readiness Center. It appeared not to have been converted in accordance with NG PAM 420-15 and it was being used as storage. Samples above the criteria were collected from the bullet trap and the middle of the floor and were reported to have lead concentrations of 18,000 µg/ft^2 and 1,100 µg/ft^2 respectively. Samples ranged from 5.5 to 90 times the National Guard criteria. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for MA ARNG
Bourne Readiness Center on August 17, 2010.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
BOU-PB-01	Room 2, Radiation Supply Vent	<110
BOU-PB-02	Room 12, From Counter	<110
BOU-PB-03	Drill Hall, Top of Flammable Cabinet	<110

Table 1 – Results of Dust Wipe Sampling for MA ARNG Bourne Readiness Center on August 17, 2010.

Wipe Sample #	Sample Location	Result (µg/ft²)*
BOU-PB-04	Drill Hall, Middle of Floor	<110
BOU-PB-05	Drill Hall, Table by Entrance to Hall #7	<110
BOU-PB-06	Room 8**, Bullet Trap	**18,000**
BOU-PB-07	Room 8**, Light Fixture	<110
BOU-PB-08	Room 8**, Stored Manuals	<110
BOU-PB-09	Room 8**, Middle of Floor	**1,100**
BOU-PB-10	Drill Hall, Immediately Outside Room 8	160
BOU-PB-11	Room 9, On Top of File Cabinet	<110
BOU-PB-12	Room 11, From Dining Table	<110
BOU-PB-13	Room 4, Desk Top	<110
BOU-PB-14	Room 18, Window Sill	<110
BOU-PB-15	Room 20, File Cabinet	<110

*The US Army CHPPM recommends a maximum level for adult exposures of 200 µg/ft² lead on floors
**Room 8 is a former indoor firing range, not converted but used as storage

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 and ceiling of the boiler room; therefore, two paint chip samples were collected. The paint chip samples were collected following operational protocols set forth in HUD's *Guidelines for the Evaluation and Control of Lead-Based Paint Hazard in Housing (1995)*. The paint chip samples were submitted to Aerosol Monitoring and Analysis Analytical Services, Inc. (AMA) of Lanham, MD for analysis. The analyses were performed using Flame Atomic Absorption Spectrophotometry (AAS) following the analytical method SW 846 7420. AMA is accredited for the analysis of paint chip samples through the AIHA Proficiency Testing Program (#100470). In the Commonwealth of Massachusetts, paint is considered to be lead-based if it contains more than 0.5 % lead by weight. All paint chip samples were below regulatory limits of 0.5% lead by weight. Results are given in Table 2 and certificates of analysis are included in Appendix B.

Table 2 – Results of Paint Chip Sampling for MA ARNG Bourne Readiness Center on August 17, 2010.

Paint Chip Sample #	Sample Location	Result (% by wt)*
BOU-LBP-01	Boiler Room, Ceiling Paint	0.038
BOU-LBP-02	Boiler Room, Wall Paint	0.130

*Paint is considered lead-based if it is > 0.5% by weight.

Visual Inspection for Damaged Suspect Asbestos-Containing Materials

A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. No damaged suspect asbestos-containing materials were observed at the Bourne Readiness Center.

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. Staining caused by water intrusion was observed in the supply room, as well as, the ceiling of the drill hall. No mold growth was observed at the Bourne facility.

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

Illumination levels were measured using a Cal-Light 400L, calibrated on July 30, 2010, 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 that there are some illumination deficiencies in the three offices (rooms 6, 16 and 20 on the drawing) and the boiler room. The illumination measurements indoors ranged from a low of 6.1 foot candles (fc) to a high of 91 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination. Additional illumination can be achieved by replacing burned-out lamps, cleaning fixtures, relocating detailed work to more illuminated areas, using supplemental task lighting, and opening doors or windows to provide more natural lighting.

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 2010. 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 55-2004. 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 G 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 55-2004

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 80.2 to 78.8° F and 72.1 to 84.7% Rh. Outdoor temperature and humidity measurements were 79.9° F and 83.5% on the day of monitoring. Temperatures and relative humidity measurements were outside the acceptable range in all of the facility. These results are not unexpected due to outdoor conditions on the day of the survey and the lack of air conditioning in most of the facility.

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 – 2007 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 310 to 517 parts per million (ppm) and outdoor CO_2 levels were approximately 320 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange.

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 62.1-2007 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 to1.0 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, the presence of damaged suspect asbestos-containing materials, peeling potentially lead-based paints, noise hazards, indoor air quality, visible mold and housekeeping. The results of the evaluation indicated industrial hygiene concerns in the following areas: cross contamination of lead dust from the former firing range, water intrusion and lighting. Overall, Bourne Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees.

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.

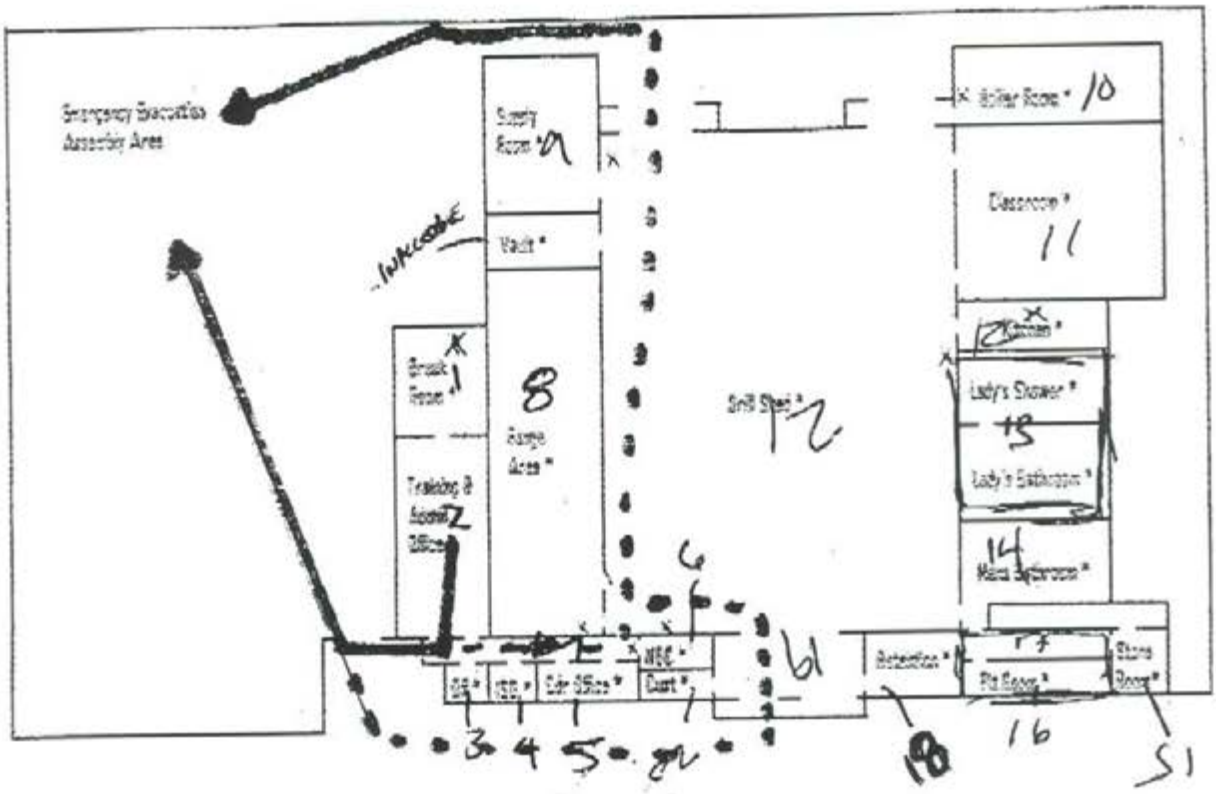
9 References

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, August 23, 2007.
6. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 15, 1998.
7. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
8. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
9. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
10. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
11. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2007, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2004, "Thermal Environmental Conditions for Human Occupancy".
12. NIOSH website: http://www.cdc.gov/niosh/
13. OSHA website: http://www.osha.gov/.
14. Army CHPPM website: http://chppm-www.apgea.army.mil/.
15. EPA website: http://www.epa.gov.

Appendix A
Building Layout

APPENDIX A

Emergency Evacuation Plan



Buzzards Bay Armory Layout

KEY

• = Your Location

X = Fire Extinguisher Locations

→ = Primary Exit Route to Assembly Area

---- = Alternate Exit Route to Assembly Area

Appendix B
Certificates of Analysis for Air, Dust Wipe and Bulk Samples

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

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Bourne Rediness Center	**Chain Of Custody:**	508594
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Bourne, MA	**Date Submitted:**	8/19/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-0003	**Date Analyzed:**	8/26/2010 **Report Date:** 8/26/2010

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
1071868	BOU-PB-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071869	BOU-PB-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071870	BOU-PB-03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071871	BOU-PB-04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071872	BOU-PB-05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071873	BOU-PB-06	Flame	Wipe	****	0.108	110	ug/ft²	2000	18000	ug/ft²	
1071874	BOU-PB-07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071875	BOU-PB-08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071876	BOU-PB-09	Flame	Wipe	****	0.108	110	ug/ft²	120	1100	ug/ft²	
1071877	BOU-PB-10	Flame	Wipe	****	0.108	110	ug/ft²	17	160	ug/ft²	
1071878	BOU-PB-11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071879	BOU-PB-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071880	BOU-PB-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071881	BOU-PB-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071882	BOU-PB-15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071883	BOU-LBP-01	Flame	Paint Chip	****	N/A	0.0068	%Pb		0.038	%Pb	
1071884	BOU-LBP-02	Flame	Paint Chip	****	N/A	0.0092	%Pb		0.13	%Pb	

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

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Bourne Rediness Center	**Chain Of Custody:**	508594
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Bourne, MA	**Date Submitted:**	8/19/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-0003	**Date Analyzed:**	8/26/2010 **Report Date:** 8/26/2010

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)-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) 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 sampes.

NY ELAP accreditation applies only to paint chip, wipe, and soil samples.

Analyst: Non-Responsive

Technical Manager Non-Responsive

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)

508594
Pg 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: Bourne Readiness Center
2. Job Location: Bourne MA
3. Job #: [redacted]
4. Contact Person: [redacted] 942-0273
5. Submitted by: [redacted]

Reporting Information (Results will be provided [redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due: ❑ 24 Hours Time Due: Comments:	❑ Immediate ❑ Next Day ❑ 2 Day ❑ 3 Day ☒ 5 Day Date Due: 8/26/10 ❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	☒ Include COC/Field Data Sheets with Report ☒ Email [redacted] ARCAENVIRO.COM ❑ Fax: [redacted] @us.army.mil ❑ Verbal [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 2 (QTY)
- ☒ Pb Dust Wipe (wipe type GHOST) 15 (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	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
BOU-PB-01		8/16/10		10x10 cm				X				X					Date/Time: Contact: By:
BOU-PB-02		↓						↓				↓					
BOU-PB-03																	
BOU-PB-04																	
BOU-PB-05																	Date/Time: Contact: By:
BOU-PB-06																	
BOU-PB-07																	
BOU-PB-08																	
BOU-PB-09																	Date/Time: Contact: By:
BOU-PB-10																	
BOU-PB-11																	
BOU-PB-12		↓						↓				↓					[redacted]

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 8 / 19 / 10 @ 1020 Via: FedEx By (Print): [redacted]
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ By: ____ Date: ____ / ____ / ____ Time: ____
4. Comments: ____

AMA Analytical Services, Inc.
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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 508594 Pg 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:
2. Job Location:
3. Job #: P.O. #: W912K6-09-A-0003
4. Contact Pers [redacted] 0) 942-0273
5. Submitted by [redacted]

Reporting Information (Results will be provide[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:
❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ Ema[redacted]@
❑ Fax: [redacted] @us.army.mil
❑ Verb[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 ℃)

Metals Analysis
❑ Pb Paint Chip (QTY)
❑ Pb Dust Wipe (wipe type) (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	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
BOU-PB-13		8/16/10		10x10 cm				X				X					Date/Time: Contact: By:
BOU-PB-14		↓		↓				↓				X					
BOU-PB-15												X					
BOU-LBP-01											X						
BOU-LBP-02		↓						↓			X						Date/Time: Contact: By:
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): S[redacted]
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / FOIA Requ[redacted]
4. Comments:

[redacted]

Appendix C
Photo Documentation

Bourne RC

Drill Hall

Storage Area

Water Intrusion on Ceiling

Water Intrusion on Ceiling

Bourne RC

Remnants of Water Leak

Remnants of Water Leak

Boiler Room

Flaking Paint on Ceiling

Bourne RC

Flaking Paint on Ceiling

Flaking Paint on Wall

Mess Hall

Kitchen

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	**Bourne**	IAQ							Light		
Date	8/17/2010	Inspector	Non-Responsive	Instrument		TSI Q-Trak Plus Model 8554					Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		8554-02041015					Serial Number		K070277
Weather Conditions				Last Calibration		Mar-10					Last Calibration		30-Jul-10
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Value (fc)
1	Break Room			80.2	X	84.7	X	375		0.3		91.0		10
2	Office			80.2	X	84.7	X	342		0.7		87.8		50
3	Office			80.1	X	83.9	X	391		0.4		60.0		50
4	Office			80.1	X	83.4	X	378		0.5		59.6		50
5	Office/ Conference			79.9	X	82.2	X	369		0.5		56.4		50
6	Office			79.7	X	82.7	X	329		0.3		22.2	X	50
7	Hall			79.5	X	78.9	X	349		0.1		73.4		5
8	Storage			79.3	X	78.1	X	336		0.4		42.6		30
9	Supply Room			79.5	X	72.1	X	465		0.6		49.2		30
10	Boiler Room			79.5	X	80.1	X	379		0.0		22.2	X	30
11	Mess Hall			79.0	X	81.9	X	345		0.9		72.0		10
12	Kitchen			79.2	X	84.4	X	329		1.0		66.4		50
13	Women's Room			79.3	X	82.2	X	324		0.7		12.1		5
14	Men's Room			79.3	X	82.8	X	311		0.5		21.5		5
15	Storage			78.8	X	79.4	X	310		1.0		17.4		10
16	Office			78.8	X	77.5	X	395		0.9		6.1	X	50
17	Hall			79.0	X	77.0	X	332		0.4		6.1		5
18	Office/ Storage			80.1	X	75.5	X	517		0.3		72.8		30-50

Notes:

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°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

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Leve

State	MA	City	Bourne	IAQ								Light		
Date	8/17/2010	Inspector	Non-Responsive	Instrument		TSI Q-Trak Plus Model 8554						Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		8554-02041015						Serial Number		K070277
Weather Conditions				Last Calibration		Mar-10						Last Calibration		30-Jul-10
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Comments
19	Entry			79.9	X	77.5	X	348		0.6		28.9		10
20	Office			79.5	X	81.8	X	325		0.4		28.0	X	50
21	Drill Shed			79.7	X	83.5	X	319		0.3		67.3		30
Notes:				Relative Humidity		Winter Temp.		Summer Temp.						
				30%		68.5°F-76.0°F		74.0°F-80.0°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						

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
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
10 ARMORY ROAD
BOURNE, MA 02532

June 17, 2013
PN: 39743799

Non-Responsive
Director, Industrial Hygiene Services

Non-Responsive
Project Manager

TABLE OF CONTENTS

APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
70 ARMORY RD., BOURNE, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in several locations tested.	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, arm rests 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		
Five of the 10 lead wipe samples indicated elevated lead levels.	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
Former Indoor Firing Range		
Since the former indoor firing range is contaminated with lead and several wipe samples were found to contain elevated lead levels, an assessment should be made as to whether respiratory protection and other PPE should be worn when entering this area. Materials leaving the firing range should be spot-checked for lead contamination and cleaned if necessary.	A respirator shall be provided for each employee when such equipment is necessary to protect the health of the employee. (29 CFR 1910.134 (a)(2)).	RAC 3
Emergency Exits		
Emergency exit signs were not visible from all areas of the facility or illuminated.	Emergency exits should be properly illuminated (29 CFR 1910.37 (q)(6)).	RAC 3

Findings	Recommendations	Risk Assessment Code (RAC)
Asbestos		
Damaged presumed asbestos-containing floor tile and mastic were observed throughout the facility; an Asbestos Operation and Maintenance Program was not available on-site.	Develop a site-specific asbestos operations and maintenance program for management of asbestos-containing materials in place as required by OSHA 29 CFR 1910.1001(j)(2).	RAC 3
PPE		
Hazard assessments have not been conducted to determine whether personal protective equipment is 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 4
Water Intrusion		
Water staining was observed on the ceiling throughout the Assembly Hall.	The source of the water intrusion should be identified and repaired. The water-stained materials should be repaired or replaced (ACGIH – Guidelines for the Assessment of Bio-aerosols in the Indoor Environment).	RAC 4
Extension Cords		
Extension cords were being used as permanent wiring in the administrative areas.	Extension cords must be secured to avoid a tripping hazard and are only permitted on a temporary basis. (29 CFR 1910.303).	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 Readiness Center in Bourne, Massachusetts.

URS representative, Ms. Non-Responsive, conducted the Industrial Hygiene Survey on May 8, 2013. 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 mapping.

The Bourne Readiness Center is a one-story brick building, consisting of offices, a classroom/mess hall, supply areas, gender separate bathrooms, storage rooms, a kitchen, an Assembly Hall, a former Indoor Firing Range and a storage outbuilding. A layout of the Readiness Center is provided in Appendix A.

GENERAL: Emergency exit signs were not posted and illuminated throughout the facility. Emergency escape plans were not posted throughout the facility. Extension cords were being used as permanent wiring. Evidence of moderate water intrusion was noted throughout the Assembly Hall, largely in the south corner.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in several of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress work areas must be lighted by at least the minimum light intensities.

LEAD: Five of ten wipe samples collected in the Readiness Center were found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

On the day of the survey, the two paint chip samples were found to contain a level of lead below the HUD criteria for determination of paint as lead-based.

ASBESTOS: Damaged presumed asbestos-containing floor tiles were noted throughout the facility. No Asbestos Operations and Maintenance Program was found on site. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. 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, keyboards, and monitors were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker.

NOISE: Noise mapping levels in the Readiness Center determined that noise levels were below the OSHA permissible exposure limit (PEL) and Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and conducting administrative functions. The building includes offices, a classroom/mess hall, supply areas, gender separate bathrooms, storage rooms, a kitchen, an Assembly Hall, a former Indoor Firing Range and a storage outbuilding.

The Readiness Center was found to be neat and organized at the time of URS' site visit.

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 Readiness Center. Interior carbon dioxide concentrations were found to be between 433 and 624 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (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 but is typically 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 380 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below 1080 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 Readiness Center was measured between 0.0 ppm and 0.1 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-Trak 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.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 54.5%, which was within the guideline of less than 65% recommended by ASHRAE.

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.

The average temperature inside the Readiness Center was, 68.3 °F, which was within the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Readiness Center 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 in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
Admin/ corner Conference Room, conference table	Admin	**46.7**	50
Admin/ corner Conference Room, desk	Admin	**40.7**	50
Admin, desk- Non-Responsive	Admin	**33.6**	50
Admin, desk- Non-Responsive	Admin	**33.7**	50
Admin, side desk	Admin	**24.9**	50
West hallway	Hall	21.0	5
West Admin, office, desk- Non-Responsive	Admin	**43.8**	50
Company Commander Office, conference table	Admin	60.9	50
Company Commander Office, desk	Admin	67.0	50
Company Commander Office, desk	Admin	110.7	50
NBC Office, desk- Non-Responsive	Admin	**12.0**	50
West Admin, desk	Admin	**37.7**	50
Mess Hall, table	Break Room	50.0	10
Mess Hall, computer workstation	Admin	**37.5**	50
Supply Room, counter	Storage	30.0	30
Supply Room, storage shelves	Storage	**11.0**	30
East Admin/ Classroom, desk	Admin	**21.0**	50
East Admin/ Classroom, desk	Admin	**23.2**	50

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in most of the locations tested throughout the facility.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center 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 Readiness Center

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Foot ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Foot ($\mu g/ft^2$)
Mess Hall, window sill, center of room	Bourne RC Wipe-01	0.108	**820**	200
West Admin/ Conference Room, bookshelf, bottom shelf	Bourne RC Wipe-02	0.108	<110	200
South Admin, office, floor between file cabinet and wall	Bourne RC Wipe-03	0.108	<110	200
East Admin, floor at entry, under light switch	Bourne RC Wipe-04	0.108	130	200
Latrine, Men's, floor behind door	Bourne RC Wipe-05	0.108	140	200
Former Indoor Firing Range, floor at doorway to range, by drain line	Bourne RC Wipe-06	0.108	**1100**	200
Former Indoor Firing Range, floor at entry	Bourne RC Wipe-07	0.108	**270**	200
Drill Hall, floor, under lockers along west perimeter	Bourne RC Wipe-08	0.108	<110	200
East Storage, top of radiator, along perimeter	Bourne RC Wipe-09	0.108	**450**	200
Boiler Room, floor at base of stairs	Bourne RC Wipe-10	0.108	**18000**	200

Five of the ten surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

Two paint chip samples were collected from areas of peeling paint in the facility and were analyzed for lead content. The analytical report from AMA is contained in Appendix C.

According to the U.S. Department of Housing and Urban Development (HUD), paint is considered to be lead-based if the quantity of lead is greater than 0.5% by weight. OSHA has not established a minimum percentage of lead to be defined as lead-based paint, therefore paint with lead in any amount above the analytical detection limit is considered to be lead-based under these regulations. The results of URS' lead paint testing are contained in Table 2-3.

Table 2-3
Lead Content in Painted Surfaces

Paint Location	Lead Concentration (Percent Weight)	HUD Lead-Based Quantity (Percent Weight)
Dull green paint, ceiling/ walls in Boiler Room	0.054	0.5
Light green paint, walls, east storage	0.011	0.5

On the day of the survey, none of the paint chip samples were found to have a lead content above the HUD criteria for determination of paint as lead-based.

2.2.7 Asbestos

No damaged, friable materials were identified during this survey for sample collection.

Damaged presumed asbestos-containing floor tiles and associated mastic were also identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

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, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Noise mapping was conducted throughout the Readiness Center. Area noise mapping results indicated that, on the day of the survey, noise levels throughout the Readiness

Center ranged from 58.0 decibels to 60.5 decibels. All noise mapping results were below the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 dBA/8-hour day.

2.5 Personal Protective Equipment

Personal protective equipment was orderly and readily available to employees in the Readiness Center. Personal protective equipment included safety glasses, hard hats, ear plugs and nitrile gloves.

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. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise dosimetry results and a review of normal site operations, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was not identified on site. No operations were observed by URS that would require the use of respiratory protection. If workers are allowed access to the former firing range, a hazard assessment should be conducted to determine whether respiratory protection and other forms of PPE should be required in this area.

3.4 Hazard Communication

A site-specific hazard communication program was identified on site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A written personal protective equipment program was identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site. According to interviews with facility personnel, the facility recently had an asbestos-containing materials re-inspection.

3.7 Safety

Emergency exit signs were not posted and illuminated throughout the facility. Emergency escape plans were not posted throughout the facility. Extension cords were being used as permanent wiring.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

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, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15

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

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

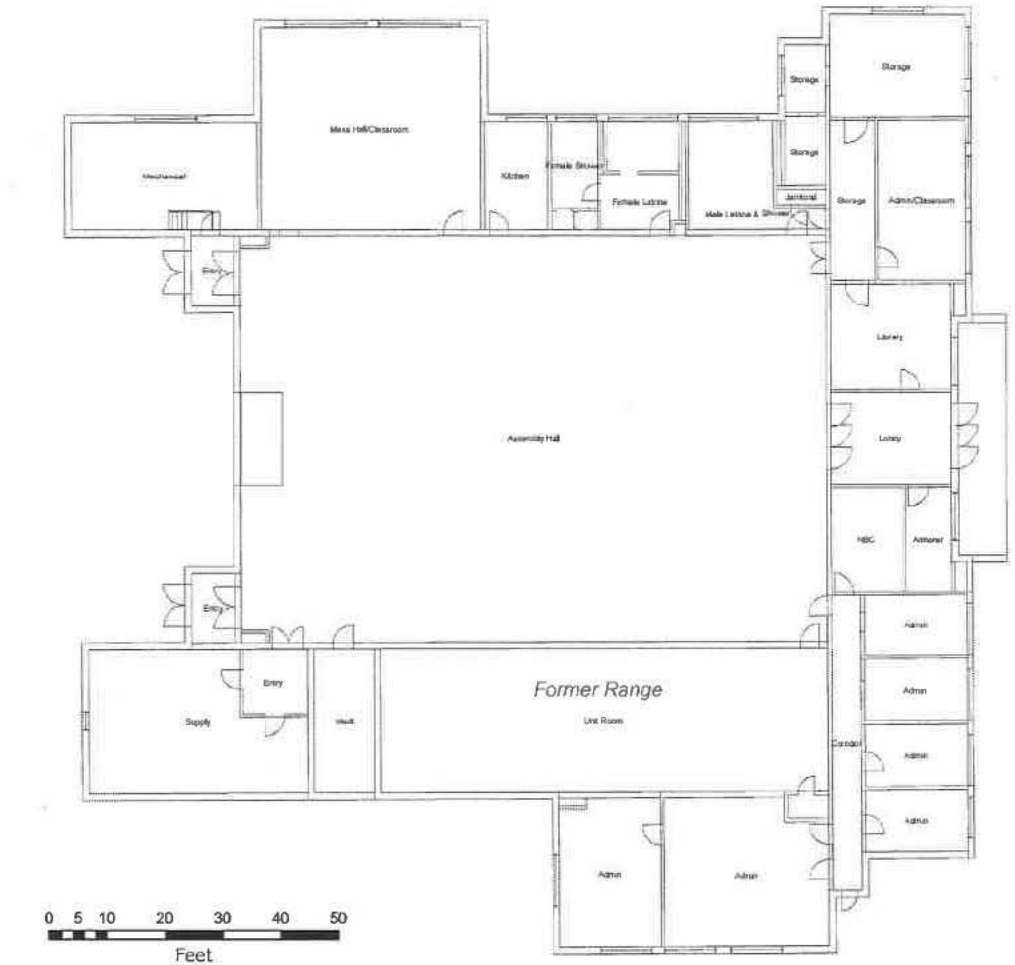
OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

APPENDIX A

SHOP DRAWING

BOURNE ARMORY - 25A30
Floor Plan

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS, MILFORD, MA
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE



0 5 10 20 30 40 50
Feet

0 5 10 20
Meters

Massachusetts 1 250 NAD83/WGS84

The information on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis.

Drawn by William A. Cooney
GIS Specialist-CFMO
Commonwealth of Massachusetts
Military Division

5 MAy 2011

APPENDIX B

PERSONNEL LIST

DEPARTMENT OF THE ARMY
379th ENGINEER COMPANY (Horizontal)
MASSACHUSETTS NATIONAL GUARD
10 Armory Rd.
Buzzards Bay Ma 02532

REPLY TO
ATTENTION OF:

NGMA-ENB-HZ

08 May 2013

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: 379th Full Time Staff

1. The full time staff for the 379th Engineer Company (Horizontal) are as follows.

Non-Responsive SG Operations NCO

SG Training NCO

SG Supply NCO

2. Period: Until officially relieved.

3. Purpose: Fo Health and Safety.

4. Questions or concerns can be addressed to SSG Non-Responsive (Supply NCO) 379TH EN CO at Non-Responsive

Non-Responsive

SSG, EN
Supply NCO

Dist:
1-ea indiv concerned

APPENDIX C

ANALYTICAL RESULTS

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:**	MA ARNG	**Chain Of Custody:**	515892
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	10 Armory Road, Bourne, MA	**Date Submitted:**	5/15/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Bourne RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/21/2013 **Report Date:** 5/21/2013

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
13062397	BourneRC Wipe-01	Flame	Wipe	****	0.108	110	ug/ft²	88	820	ug/ft²	
13062398	BourneRC Wipe-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13062399	BourneRC Wipe-03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13062400	BourneRC Wipe-04	Flame	Wipe	****	0.108	110	ug/ft²	14	130	ug/ft²	
13062401	BourneRC Wipe-05	Flame	Wipe	****	0.108	110	ug/ft²	15	140	ug/ft²	
13062402	BourneRC Wipe-06	Flame	Wipe	****	0.108	110	ug/ft²	120	1100	ug/ft²	
13062403	BourneRC Wipe-07	Flame	Wipe	****	0.108	110	ug/ft²	29	270	ug/ft²	
13062404	BourneRC Wipe-08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13062405	BourneRC Wipe-09	Flame	Wipe	****	0.108	110	ug/ft²	49	450	ug/ft²	
13062406	BourneRC Wipe-10	Flame	Wipe	****	0.108	110	ug/ft²	1900	18000	ug/ft²	
13062407	BourneRC Wipe-FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13062408	BourneRC LBP-01	Flame	Paint Chip	****	N/A	0.0072	%Pb		0.054	%Pb	
13062409	BourneRC LBP-02	Flame	Paint Chip	****	N/A	0.0076	%Pb		0.011	%Pb	

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:**	MA ARNG	**Chain Of Custody:**	515892		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	10 Armory Road, Bourne, MA	**Date Submitted:**	5/15/2013		
	Havre de Grace, Maryland 21078	**Job Number:**	Bourne RC	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/21/2013	**Report Date:**	5/21/2013

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

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) 515892 Pg 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: MA JARNG
2. Job Location: 10 Armory Rd., Bourne, MA
3. Job #: Bourne RC P.O. #: W912K6-09-A-0003
4. Contact Per: [redacted]
5. Submitted [redacted]

Reporting Information (Results will be provided as soon as technically feasible): phone: [redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REP
❑ Immediate Date Due:	❑ Immediate ❑ 3 Day	[redacted] with Report
❑ 24 Hours Time Due:	❑ Next Day X 5 Day +	[redacted] .com
Comments:	❑ 2 Day Date Due: 5/22/13	❑ Fax: [redacted] .us.army.mil
	❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	❑ Verba [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)

X All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
- X Pb Paint Chip 2 (QTY)
- X Pb Dust Wipe (wipe type ghost) 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	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Bourne RC Wipe-01	Hallway	5/8/13		100cm²				X				X				
Bourne RC Wipe-02	"			"				X				X				
Bourne RC Wipe-03	"			"				X				X				
Bourne RC Wipe-04	"			"				X				X				
Bourne RC Wipe-05	"			"				X				X				
Bourne RC Wipe-06	Maintenance			"				X				X				
Bourne RC Wipe-07	"			"				X				X				
Bourne RC Wipe-08	"			"				X				X				
Bourne RC Wipe-09	"			"				X				X				
Bourne RC Wipe-10	"			"				X				X				
Bourne RC Wipe-FB	Field Blank			—				X				X				
Bourne RC LBP-01	dull green paint							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: 5/15/13 @ Via: FedEx By (Print): [redacted] Sign: [redacted]
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Date: / / Time: Initials:
4. Comments: (410) 0954 8942

159202 210 REV. 6.08

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)

pg 2 of 2
S15892

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: MA JABNG
2. Job Location: 10 Harmon Rd, Bourne, MA
3. Job #: Bourne BC
4. Contact Perso [redacted] Non-Responsive
5. Submitted by: [redacted] Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible): phone: [redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Include COC/Field Data Sheets with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	☒ Email: [redacted].com
Comments:	☐ 2 Day Date Due:	☐ Fax: [redacted] ny.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ Verbal [redacted] ny.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 ℃)

Metals Analysis
- ☒ Pb Paint Chip 2 (QTY)
- ☒ Pb Dust Wipe (wipe type ghost) 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	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WATER AND OTHER	SPORE TRAP	TAPE	SWAB
BOURNE BC LEAD-02	light green paint	5/8/12						X			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: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: BEST AVAILABLE COPY Date: / / Time: Initials:
4. Comments:

APPENDIX D

PHOTOGRAPHIC LOG

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Bourne RC	10 Armory Rd., Bourne, MA	39743799

Photo No.	Date:
1	5/8/13

Description:

Damaged presumed asbestos-containing floor tiles and associated mastic in the Mess Hall/ Classroom.

Photo No.	Date:
2	5/8/13

Description:

Water staining on the Assembly Hall ceiling.

P:\Project\National Guard Bureau\39743798 IH Services ME & MA\39743799 - MA Sites\Reports\Bourne RC\Bourne RC Photo Log docx

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Bourne RC	10 Armory Rd., Bourne, MA	39743799

Photo No.	Date:
3	5/8/13

Description:

Extension cords being used as permanent wiring in administrative areas.

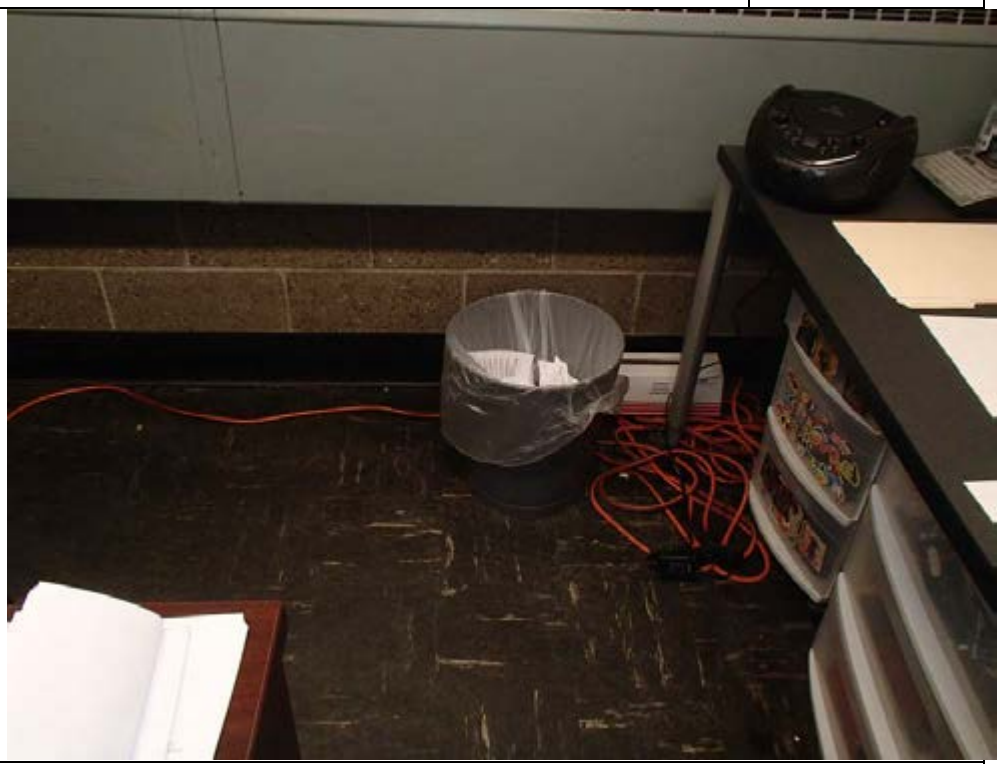

Photo No.	Date:
4	5/8/13

Description:

Storage outbuilding.

P:\Project\National Guard Bureau\39743798 IH Services ME & MA\39743799 - MA Sites\Reports\Bourne RC\Bourne RC Photo Log docx

APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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

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 µg/ft^2 on floors and 250 µg/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.

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
BRAINTREE READINESS CENTER
275 UNION STREET
BRAINTREE, MASSACHUSETTS

March 2006
PN: 39741508

Non-Responsive

Office Manager

Non-Responsive

Project Manager

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APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in half 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
Lead		
Lead was detected in wipe samples collected from the firing range and the administrative area in amounts greater than 200 µg/ft2	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 brown lead-based paint was present in classroom #24.	Personnel trained in accordance with the OSHA Lead Standard should stabilize peeling lead paint (OSHA 29 CFR 1910.1025 (h)(1))	RAC 4
Asbestos		
Damaged floor tile, window glazing, pipe insulation and pipe fitting insulation containing greater than 1% asbestos was present in this facility.	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 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
Fire Alarm Systems		
A pull firm alarm was blocked by some equipment in the drill hall.	The employer shall assure that manually operated actuation devices for use in conjunction with employee alarms are unobstructed, conspicuous and readily accessible. (OSHA 29 CFR 1910.165(e))	RAC 2

FINDINGS AND RECOMMENDATIONS (Cont)

Findings	Recommendation	Risk Assessment Code
Electrical Safety		
Electrical panels obstructed by equipment in room #15.	Electrical panels must be kept clear of obstructions for a minimum of 3 feet (OSHA 29 CFR 1910.303(g)(1)(i)).	RAC 2
Mold		
Watermarks were observed on the ceiling tiles in office #5, office #8 and office #10. 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 Region North Industrial Hygiene Office (NGB), URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center located at 275 Union Street in Braintree, Massachusetts. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On February 19, 2004, Mr Non-Responsive an industrial hygienist with URS, conducted a site visit to the Readiness Center in Braintree, Massachusetts. 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. Mr. Non-Responsive of the State of Massachusetts was Mr. Non-Responsive site contact for this survey.

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.

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. All computer workstations were found to be acceptable with regard to ergonomic design. The computer monitors were all at eye level and the chairs could be adjusted to make the occupant comfortable.

Watermarks were observed on the ceiling tiles in office #5 (Photo # 3856), office #8 (Photo # 3857) and office #10 (Photo # 3858). Mold growth could become an issue if left unattended.

The electrical panels in room #15 were obstructed by equipment at the time of this survey (Photo # 3859).

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 18.9 – 28.4% with an average of 20.2%. This average reading was below the recommended levels of between 30.0% and 60.0% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 55-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 410 to 457 parts per million (ppm), with an average of 439 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 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 background level. Given a background level of 350 ppm on the day of the survey, the ASHRAE limit would be 1050 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide was also measured in the Readiness Center. Carbon monoxide concentrations remained at 0 parts per million (ppm) throughout the survey period. 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 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. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

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 Illuminance (lux)	Recommended Minimum Illuminance (lux)
Office # 5	Administrative Duties	753	500
Office # 6	Administrative Duties	355	500
Office # 7	Administrative Duties	540	500
Office # 8	Administrative Duties	518	500
Office # 10	Administrative Duties	267	500
Office # 13 – Desk #1	Administrative Duties	223	500
Office # 13 – Desk #2	Administrative Duties	297	500
Hallway # 9	Accessway	131	30
Hallway # 12	Accessway	155	30

On the day of the survey the illuminance in the administrative area was inadequate in approximately half of the offices.

2.2.5 Lead

Paint chips were collected where paint was peeling and sent to AMA Analytical Services, Inc. (AMA) for analysis. One sample 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 2-2 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)
Storage #4	0219-LPC02	0.01	0.12
Classroom #24	0219-LPC03	0.01	1.3
Classroom #25	0219-LPC04	0.01	<0.011
Kitchen #23	0219-LPC05	0.01	0.082

The analytical report from AMA is contained in Appendix D.

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 2-3 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 Safe Surface Contamination Level ($\mu g/ft^2$)
Office #5 – Top of the Desk	0219-LW03	0.111	37	200
Lobby #12 – Top of a Table	0219-LW04	0.111	120	200
Room #15 – Top of a Locker	0219-LW05	0.111	330	200
Blank	0219-LWBlank	N/A	0.84	200

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 (%)
Supply Room #1	Window Glazing	0219-AB01A	2
Supply Room #1	Window Glazing	0219-AB01B	2
Women's Room #20	Ceiling Block Insulation	0219-AB02A	NAD
Women's Room #20	Ceiling Block Insulation	0219-AB02B	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

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in approximately half of the 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: Of the three surface samples that were collected in the administrative area for lead, one was found to contain lead in a quantity greater than 200 micrograms per square foot (See Appendix G). The brown paint chip sample from window sill in classroom #24 (Photo # 3862) was found to lead based. URS recommends that an appropriately licensed lead contractor clean the area with an elevated lead level. It is also recommended that the peeling lead paint be stabilized to prevent further spread of lead dust.

ASBESTOS: Broken and missing 9"x9" asbestos-containing floor tile was found in hallway #9 (Photo # 3855), classroom #24 (Photo # 3861) and in classroom #25 (Photo # 3863). The window glazing was also tested for asbestos and was determined to

contain greater than 1% of asbestos. The window glazing was in poor condition at the time of this survey (Photos # 3851 & 3853). The pipe fitting insulation throughout the facility was determined to contain asbestos in a previous survey conducted by ATC Associates of Woburn, Massachusetts in May of 1999. The pipe fitting insulation in supply room #1 was exposed to the room occupants (Photo # 3852). URS recommends that the damaged floor tile, window glazing and pipe fitting insulation be removed or repaired by an appropriately trained licensed technician.

ELECTRICAL SAFETY: Electrical panel in Room #15 was observed to be obstructed. Electrical panels should be kept clean for at least 30 inches.

MOLD: Water marks on ceiling tiles indicate a history of water incursions. These water incursions may lead to mold growth and potential indoor air quality issues.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The 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 (ft^2)	Result ($\mu g/ft^2$)	Maximum Safe Surface Contamination Level ($\mu g/ft^2$)
Former Firing Range-Top of Light Guard	0219-LW06	0.111	5,200	200
Former Firing Range-Top of a Locker	0219-LW07	0.111	500	200
Former Firing Range-Floor-Rear	0219-LW08	0.111	440	200
Former Firing Range-Floor-Center	0219-LW09	0.111	210	200
Former Firing Range-Floor-Front	0219-LW10	0.111	360	200
Blank	0219-LWBlank	N/A	0.84	200

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
Levels 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	0219-LA01	828	<3.6	50.0
Blank	0219-LA03	0	<3.0	50.0

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 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

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: The five surface wipe samples collected in the former firing range were found to contain lead dust levels above the maximum limit set by the NGB Region North Industrial Hygiene Office (See Appendix G). URS recommends that an appropriately licensed lead contractor clean the former firing range. Guidelines for the cleanup and rehabilitation of indoor firing ranges is provided in Appendix H.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 7,000 square foot area with about a 30-foot high ceiling used for assembling personnel and storing equipment. 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 Safe Surface Contamination Level ($\mu g/ft^2$)
Drill Hall # 28 – Floor	0219-LW01	0.111	30	200
Drill Hall # 28 – Floor	0219-LW02	0.111	100	200
Blank	0219-LWBlank	N/A	0.84	200

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

Table 4-2
Levels 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	0219-LA02	808	<3.7	50.0
Blank	0219-LA03	0	<3.0	50.0

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 50.0 $\mu g/m^3$ averaged over an 8-hour day.

One paint chip was collected 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. 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 4-3 below shows the results of the lead paint testing.

Table 4-3
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 # 27	0219-LPC01	0.01	0.025

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.

4.6 Interpretation of Results

LEAD: The air, surface wipe and paint chip samples collected in the drill hall for lead were found to be within allowable limits and require no further action at this time.

FIRE ALARM SYSTEMS: A pull fire alarm was blocked by some equipment in the drill hall (Photo # 3850). The equipment needs to be moved to another area.

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

One air sample was collected in the boiler room to evaluate the airborne fiber count. The air sample was collected according to guidelines set forth in the National Institute for Occupational Safety and Health (NIOSH) Manual of Analytical Methods, Method 7400. AMA using Phase Contrast Microscopy (PCM) in accordance with the NIOSH Method 7400 analyzed the air sample. Table 5-1 below shows the result of the air sample.

Table 5-1
Airborne Fiber Level

Location Of Sample Taken	URS Sample Number	Volume (Liters)	Results: Fibers Per Cubic Centimeter
Boiler Room # 26	0219-AA01	2443.5	<0.005
Blank 1	0219-AA02	0	*******
Blank 2	0219-AA03	0	*******

The result of the air sample was found to be below the detection limit as defined in the NIOSH 7400 method.

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: The pipe and pipe fitting insulation in the boiler room was exposed at the time of this survey (Photos # 3846-47 & 3881-82). There was debris on the floor from the damaged insulation (Photo # 3848). The air sample collected in this area determined that the airborne fiber level was below the OSHA PEL. URS recommends that a properly trained licensed technician remove the exposed insulation.

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

The hearing conservation program was found in the safety book, under chapter 10. 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

The hazard communication program was found in the Tagma Pamphlet. An Operations and Maintenance Plan (O & M) was provided to URS before the inspection in reference to the asbestos on site. The main issues concerning this program were that the asbestos has not been labeled as containing asbestos and no training records were found. These are important parts of the O &M Plan.

6.5 Personal Protective Equipment

The personal protective equipment program was found in the safety book, under chapter 10. No training records were found on site. A personal protection equipment program is not required for this site.

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 62-2001: Ventilation for Acceptable Indoor Air Quality

Army Corps of Engineers

Safety and Health Requirements Manual EM 385-1-1 November 2003

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

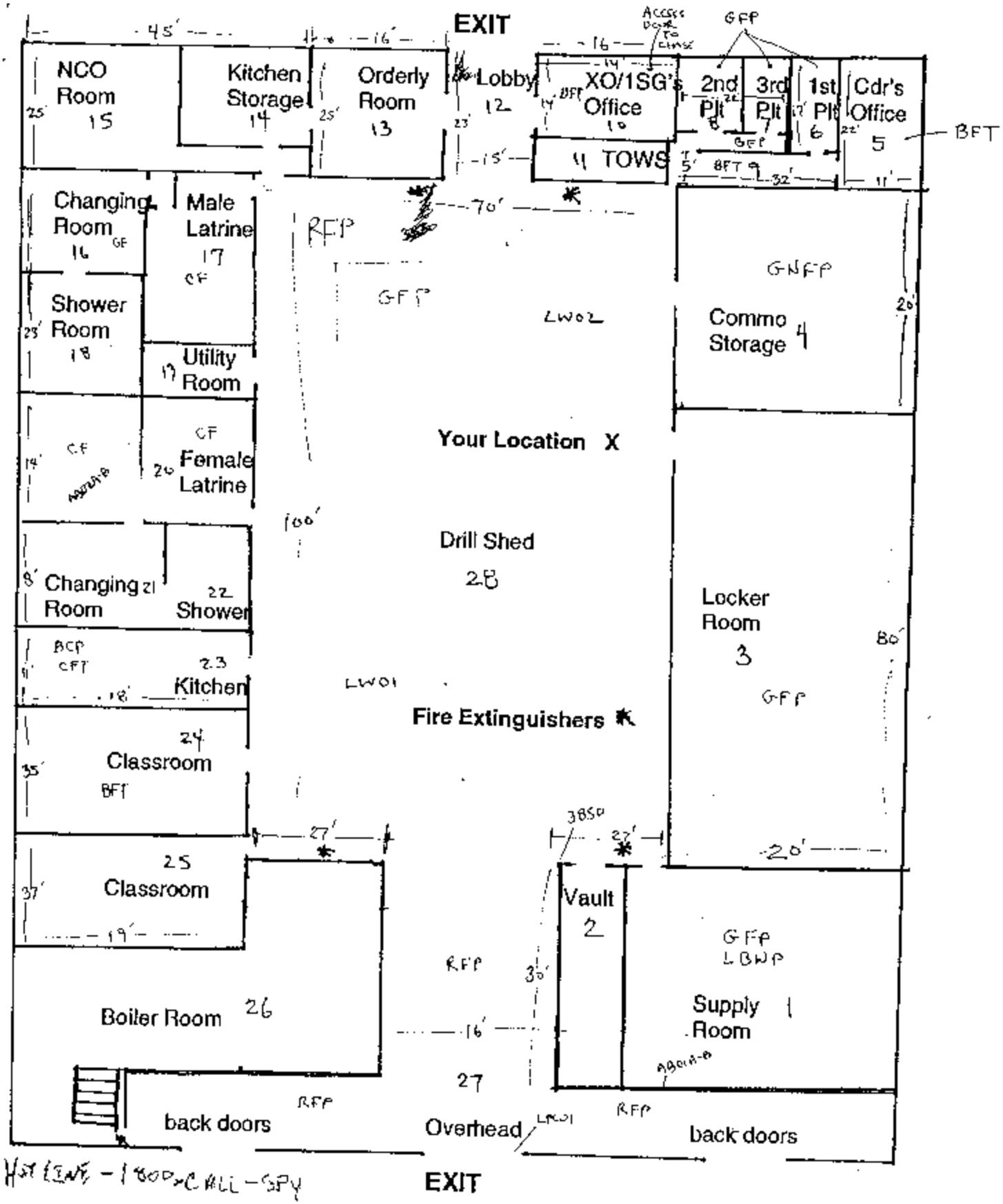
Standard for General Industry: 29 CFR 1910

APPENDIX A

SHOP DRAWING

FIRE EVACUATION PLAN

BRAINTREE, MA



HOT LINE - 1800-CALL-SPY

LBWP = Light BLUE WALL PAINT

RFP = RED FLOOR PAINT

GNFP = GREEN " "

BFT = BROWN FLOOR TILE (9"x9")

CFT = CREAM " " (12"x12")

BCP = BEIGE CERAMIC FLOOR

APPENDIX B

PERSONNEL LIST

C Co 1-182 IN (L) BRAINTREE, MA
FULL TIME PERSONNEL

LAST	FIRST	RANK
Non-Responsive		SFC
		SGT
		Armorer

APPENDIX C

HAZARDOUS MATERIALS LIST

9 GALS PAINT
1 GAL PAINT THINNER
2 GALS CLEANER- LUBRICANT
1 CAN SPRAY PAINT
6 OZ. 2 CYCLE MOTOR OIL
4 QTS CHARCOAL LIGHTER FLUID
1 LB. COLEMAN FUEL
2½ GALS GASOLINE
2 FUNNELS
1 EMPTY GAS CAN

} TOP

4 QTS HYDRAULIC FLUID
2 QTS PAINT
1 QRT ALCOHOL
1 QRT STOP LEAK
1 CAN GREASE - 1 LB.
1 OIL CAN
3 ROLLERS
3 PAINT BRUSHES
1 OIL FILTER WRENCH
1 OIL PAN
1 OIL KILLER CAN
1 QUART NEATS FOOT OIL

} MIDDLE

5 GALS PAINT
10 GALS GREASE
15 GALS OIL
2 (2 CELL) PROPANE TANKS

} BOTTOM

BEST AVAILABLE COPY

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.
Electron & Optical Microscopy Services

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	123113
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	275 Union Street Braintree, MA	**Date Analyzed:**	3/2/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	04-Mar-04
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
0427574	0219-LA 01	Flame	Air	828	N/A	3.62	ug/m³	< 3.6	ug/m³	
0427575	0219-LA 02	Flame	Air	808	N/A	3.71	ug/m³	< 3.7	ug/m³	
0427576	0219-LA 03	Flame	Air Blank	0	N/A	3.00	ug/m³	< 3	ug	
0427577	0219-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	0.025	%Pb	
0427578	0219-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb	0.12	%Pb	
0427579	0219-LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb	1.3	%Pb	
0427580	0219-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.011	%Pb	
0427581	0219-LPC 05	Flame	Paint Chip	****	N/A	0.01	%Pb	0.082	%Pb	
0427582	0219-LW 01	Furnace	Wipe	****	0.111	6.75	ug/ft^2	30	ug/ft^2	
0427583	0219-LW 02	Furnace	Wipe	****	0.111	33.75	ug/ft^2	100	ug/ft^2	
0427584	0219-LW 03	Furnace	Wipe	****	0.111	6.75	ug/ft^2	37	ug/ft^2	
0427585	0219-LW 04	Furnace	Wipe	****	0.111	33.75	ug/ft^2	120	ug/ft^2	
0427586	0219-LW 05	Flame	Wipe	****	0.111	108.01	ug/ft^2	330	ug/ft^2	
0427587	0219-LW 06	Flame	Wipe	****	0.111	108.01	ug/ft^2	5200	ug/ft^2	
0427588	0219-LW 07	Flame	Wipe	****	0.111	108.01	ug/ft^2	500	ug/ft^2	
0427589	0219-LW 08	Flame	Wipe	****	0.111	108.01	ug/ft^2	440	ug/ft^2	
0427590	0219-LW 09	Furnace	Wipe	****	0.111	67.51	ug/ft^2	210	ug/ft^2	
0427591	0219-LW 10	Flame	Wipe	****	0.111	108.01	ug/ft^2	360	ug/ft^2	
0427592	0219-LW BLANK	Furnace	Wipe Blank	****	N/A	0.30	ug	0.84	ug	

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AMA Analytical Services, Inc.
Electron & Optical Microscopy Services

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	123113
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	275 Union Street Braintree, MA	**Date Analyzed:**	3/2/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	04-Mar-04

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

Analyst: [redacted] Non-Responsive **Technical Manager:** [redacted]

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AMA Analytical Services, Inc.

Electron & Optical Microscopy Services

CERTIFICATE OF ANALYSIS

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NY ELAP
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Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	123113
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	275 Union Street Braintree, MA	**Date Analyzed:**	3/2/04
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided		
Attention:	[redacted]				

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
0427593	0219-AA 01	2443.5	14.3		< 0.005	*	CK	N/P	
0427594	0219-AA 02	0	< 7.0	*	*****		CK	BLK	1 fiber(s) per 100 fields
0427595	0219-AA 03	0	< 7.0	*	*****		CK	BLK	0.5 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.

[redacted] Non-Responsive

An AIHA (#9863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
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AMA Analytical Services, Inc.

Electron & Optical Microscopy Services

NVLAP NY ELAP AIHA

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	123113
Address:	301-JH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	275 Union Street Braintree, MA	**Date Analyzed:**	3/2/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**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	Analyst ID	Comments
0427596	0219-AB 01 A	2	2	--	--	--	--	--	--	--	--	98	Gray	CK	
0427597	0219-AB 01 B	2	2	--	--	--	--	--	--	--	--	98	Gray	CK	
0427598	0219-AB 02 A	NAD	--	--	--	--	--	--	2	--	--	98	Off-White	CK	
0427599	0219-AB 02 B	NAD	--	--	--	--	--	--	4	--	--	96	Off-White	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.

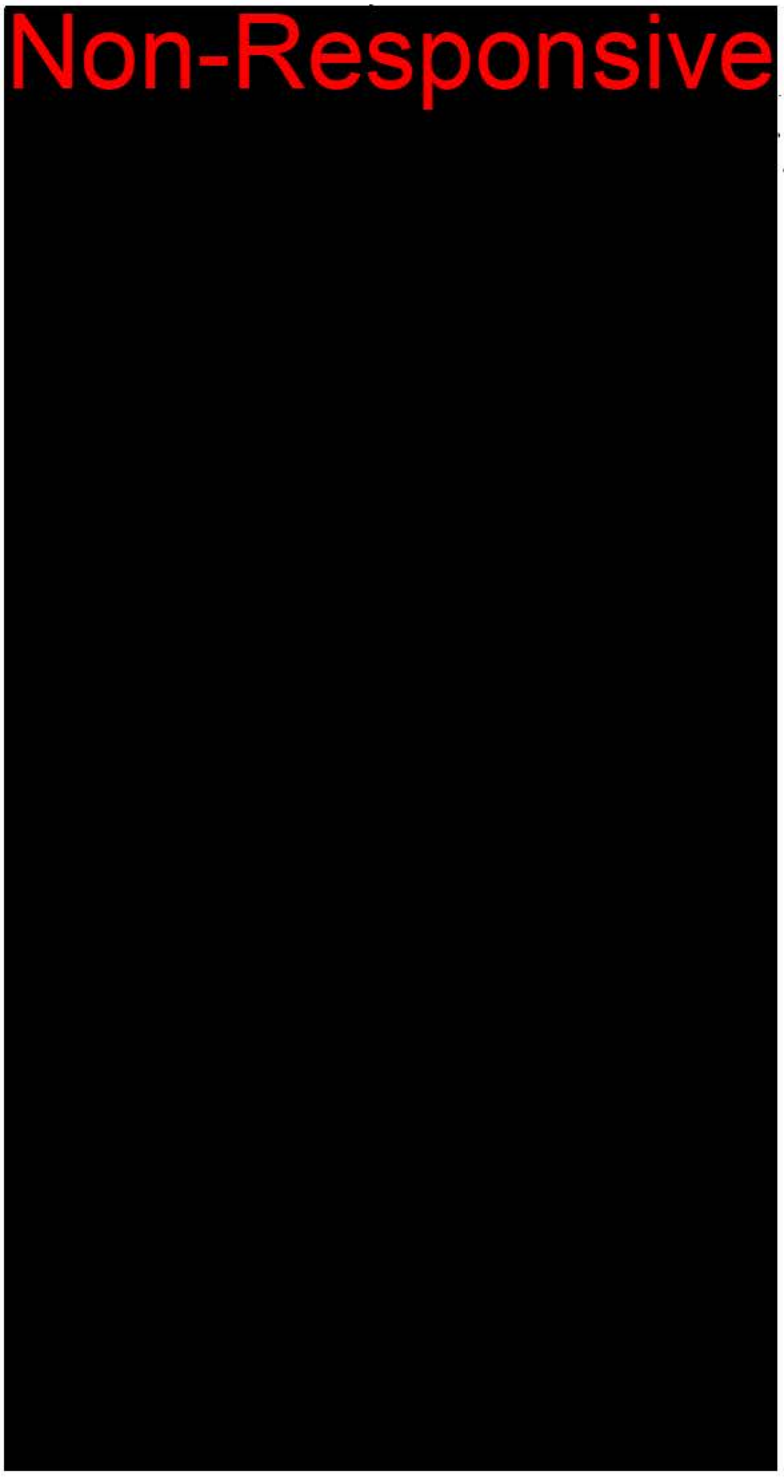
Analysis Method - EPA/600/R-93/116 dated July 1993

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

[redacted] Non-Responsive

APPENDIX E

TRAINING CERTIFICATES



BEST AVAILABLE COPY

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 as:

Asbestos Inspector Refresher

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

April 11, 2003
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

April 10, 2004
Expiration Date

03518010625349
Certificate Number

[redacted]
President/Director of Training

APPENDIX F

PHOTOGRAPHS

Photo 3846: Boiler Room Damaged asbestos-containing pipe insulation

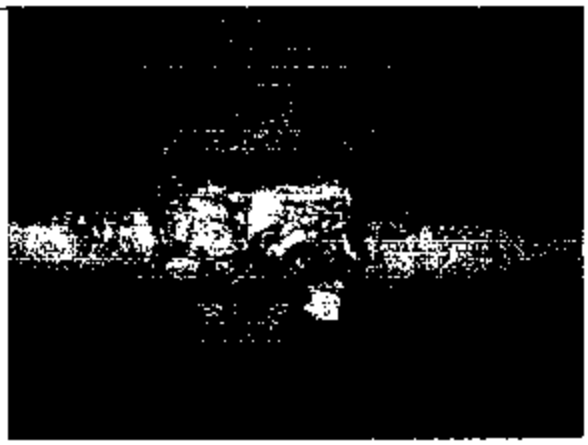


Photo 3847: Boiler Room – Damaged asbestos-containing pipe insulation

Photo 3848: Boiler Room Debris on floor

Photo 3850: Drill Hall #28 Obstructed fire alarm pull box

Photo 3851: Supply Room #1 – Damaged window glazing

Photo 3852: Supply Room #1 – Damaged asbestos-containing pipe insulation

Photo 3853: Drill Hall #28 – Damaged window glazing

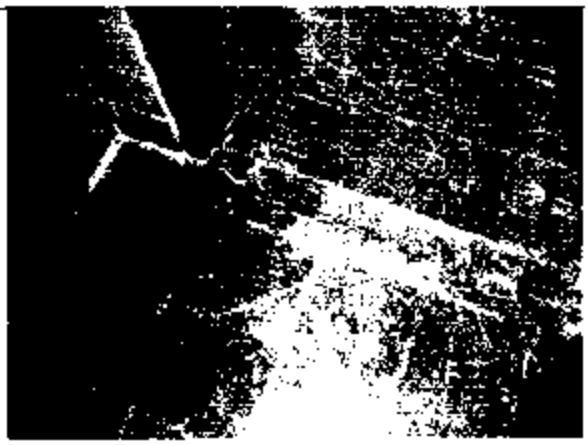


Photo 3855: Hall #9 Damaged asbestos-containing floor tile

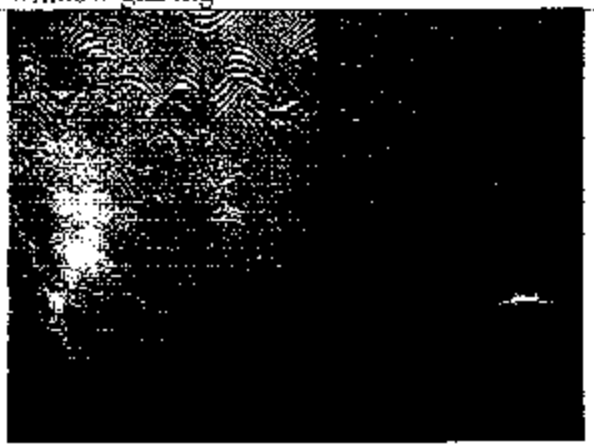


Photo 3856: Office #5 Water stains on ceiling tiles

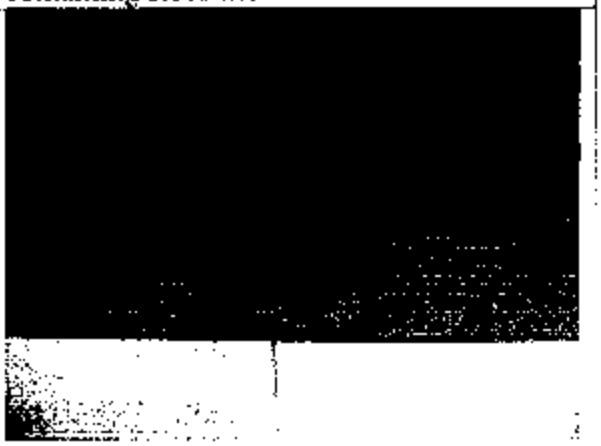


Photo 3857: Office #8 Water stains on ceiling tiles

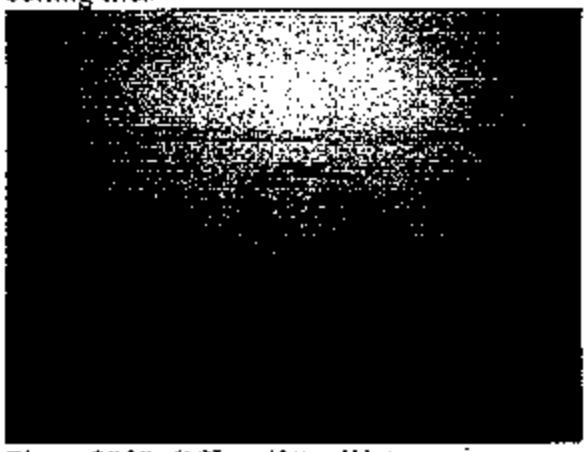


Photo 3858: Office #10 Water stains on ceiling tiles

Photo 3859: Room #15 – Obstructed electrical panel

Photo 3861: Classroom #24 - Damaged asbestos-containing floor tile

Photo 3862: Classroom #24 Flaking and peeling brown paint

Photo 3863: Classroom #25 – Damaged asbestos-containing floor tile

Photo 3881: Boiler Room – Damaged asbestos-containing pipe insulation

Photo 3882: Boiler Room – Damaged asbestos-containing pipe insulation

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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.

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.

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)

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. DHFW NIOSH 76-130 (Lead Exposure and Design Considerations for 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 [illegible]

(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 Charactoristic 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.

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.

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.

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.

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.

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

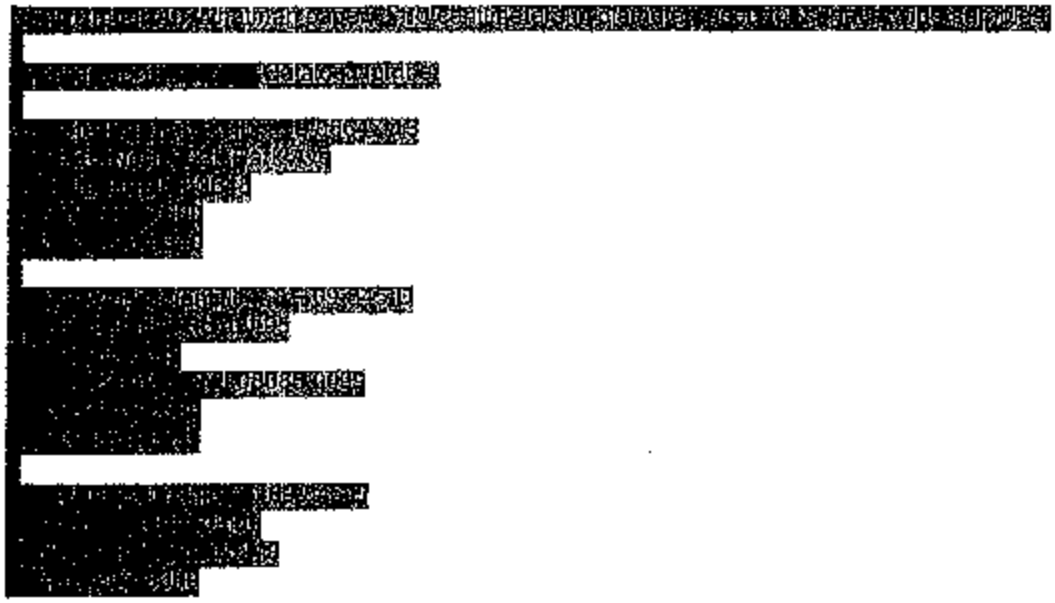
E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

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

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

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

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:

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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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

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.

Industrial Hygiene Survey

Massachusetts Army National Guard (MA ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Braintree Readiness Center

275 Union Street
Braintree, MA 02184-4926

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

Survey Date: August 20, 2010
Report Date: September 23, 2010

AEI Project #: J10-515 3d MA Braintree RC

_____

Non-Responsive

Industrial Hygienist

Table of Contents

List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Readiness Center located at 275 Union Street, Braintree, MA, 02184-4926. Non-Responsive performed the evaluation on August 20, 2010. The point of contact for the facility was Staff sergeant 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) evaluations of operations including operation description, 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:

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.

Lead in Air Samples: Lead in air samples to determine if any airborne contamination of lead existed in the facility were not collected at the Braintree Readiness Center due to sample pump malfunction.

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 areas of peeling or flaking paint were observed. Four wipe samples collected from the former firing range that has not been converted and is currently being used as a locker room were above the National Guard criteria for lead contamination (200 µg/ft^2). Samples ranged from 3 to 125 times the National Guard criteria. Lead was identified in samples collected from the overhead heater vent, on top of the light fixture, and on the floor of the range. Additionally, the wipe sample taken from the floor immediately outside the range was also above National Guard criteria.

Visual Inspection for Damaged Asbestos-Containing Materials: Damaged TSI pipe insulation and damaged insulation from the abandoned boiler were observed in the boiler room. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. Submitted samples of the pipe insulation and boiler insulation resulted in 30% and trace amounts of Chrysotile asbestos respectively.

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 leak located in the platoon room is reported by NG personnel. No 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. All areas were clean and tidy.

Lighting: The evaluation indicated no illumination deficiencies in the facility. The illumination measurements indoors ranged from a low of 19.1 foot candles (fc) to a high of 238.1 fc.

Indoor Air Quality: Temperatures and relative humidity measurements were outside the acceptable range in most of the facility. These results are not unexpected due to outdoor

conditions on the day of the survey and the lack of air conditioning in most of the facility. Indoor levels of CO ranged from 1.0 to 3.4 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations. Indoor levels of CO_2 ranged from 322 to 476 parts per million (ppm) and outdoor CO_2 levels were approximately 320 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Massachusetts Army National Guard (MA ARNG) Readiness Center located at 275 Union Street, Braintree, MA, 02184-4926 Non-Responsive performed the evaluation on August 20, 2010. The point of contact for the facility was Staff sergeant 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 Braintree Readiness Center is staffed with 2 administrative 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 Braintree 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 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 Braintree facility consists exclusively of supply and administrative duties. No maintenance of vehicles, painting of equipment or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer 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

Heat is supplied to the facility through a boiler located in the boiler room and overhead heaters in the drill hall. The boiler certificate for the Braintree facility is expired and is not up to date. Any air conditioning provided to the building is through window air conditioning units. No local ventilation systems were present at 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 water damage or mold problems; potential ergonomic problems; and housekeeping practices. Lighting and indoor air quality measurements were taken in all areas of the facility as well.

Lead in Air Samples

Lead in air samples to determine if any airborne contamination of lead existed in the facility were not collected at the Braintree Readiness Center due to sample pump malfunction.

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 areas of peeling or flaking paint were 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 10cm x 10cm templates. Wipe samples for surface dust were collected in 16 locations. The Environmental Protection Agency (EPA) and the Commonwealth of Massachusetts 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 Center for Health Promotion and Preventive Medicine (USACHPPM) 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 Aerosol Monitoring and Analysis Analytical Services, Inc. (AMA) for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Four wipe samples collected from the former firing range were above the National Guard criteria for lead contamination (200 µg/ft^2). Samples ranged from 3 to 125 times the National Guard criteria. Lead was identified in samples collected from the overhead heater vent, on top of the light fixture, and on the floor of the range. Additionally, the wipe sample taken from the floor immediately outside the range was also above National Guard criteria. The history of the indoor firing range was not known to current employees at the Readiness Center. It appeared not to have been converted in accordance with NG PAM 420-15 and it was being used as a locker room. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for MA ARNG Braintree Readiness Center on August 20, 2010.

Wipe Sample #	Sample Location	Result (µg/ft²)*
BRA-PB-01	Kitchen Room 2, From Prep Table	<110
BRA-PB-02	Room 8, From Radiator Supply Vent	<110
BRA-PB-03	Drill Hall, From Air Intake to Overhead Heaters	110
BRA-PB-04	Drill Hall, Storage Table	<110
BRA-PB-05	Drill Hall, Middle of Floor	<110
BRA-PB-06	Room 15**, Duct Work	120
BRA-PB-07	Room 15**, Light Fixture	**25,000**
BRA-PB-08	Room 15**, Overhead Heater Vent	**1,400**
BRA-PB-09	Room 15**, Stoned Footlocker	<110
BRA-PB-10	Room 15**, Middle of Floor	**600**
BRA-PB-11	Drill Hall, Floor Immediately Outside Room 15	**720**
BRA-PB-12	Room 16, From Supply Shelf	<110
BRA-PB-13	Room 6, Top of Storage Shelves	<110
BRA-PB-14	Room 9, Top of Display Case	<110
BRA-PB-15	Room 11, From Workstation	<110
BRA-PB-16	Room 13, Top of File Cabinet	<110

*The US Army CHPPM recommends a maximum level for adult exposures of 200 µg/ft² lead on floors
**Room 15 is a former indoor firing range that has not been converted and is being used as a locker 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. Damaged TSI pipe insulation and damaged insulation form the abandoned boiler were observed in the boiler room. Two bulk samples were collected and submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM) using EPA method 600/R-93/116. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. Submitted samples of the pipe insulation and boiler insulation resulted in 30% and Trace amounts of Chrysotile asbestos respectively. Results are given in Table 2 and certificates of analysis are included in Appendix B.

Table 2 – Results of Asbestos Sampling for the MA ARNG RC Braintree, MA on August 20, 2010.

Bulk Sample #	Sample Location	Result (% by wt)*
BRA-ASB-01	Boiler Room, Damaged Aircell Pipe	30% Chrysotile
BRA-ASB-02	Boiler Room, Damaged Abandoned Boiler Insulation	Trace Chrysotile

*The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation.

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 leak located in the platoon room is reported by NG personnel. No evidence of mold growth was observed on the day on 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. All areas were clean and tidy.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on July 30, 2010, 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 no illumination deficiencies in the facility. The illumination measurements indoors ranged from a low of 19.1 foot candles (fc) to a high of 238.1 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 2010. 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 55-2004. 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 G 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 55-2004

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 76.3 to 80.8° F and 53.1 to 65.2% Rh. Outdoor temperature and humidity measurements were 78.3° F and 59.6% on the day of monitoring. Temperatures and relative humidity measurements were outside the acceptable range in most of the facility. These results are not unexpected due to outdoor conditions on the day of the survey and the lack of air conditioning in most of the facility.

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 – 2007 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 322 to 476 parts per million (ppm) and outdoor CO_2 levels were approximately 320 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange.

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 62.1-2007 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 1.0 to 3.4 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, water intrusion, peeling potentially lead-based paints, noise hazards, indoor air quality, visible mold, lighting and housekeeping. The results of the evaluation indicated industrial hygiene concerns in the following areas: cross contamination from the former firing range and the presence of damaged suspect asbestos-containing materials. Overall, Braintree Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees.

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.

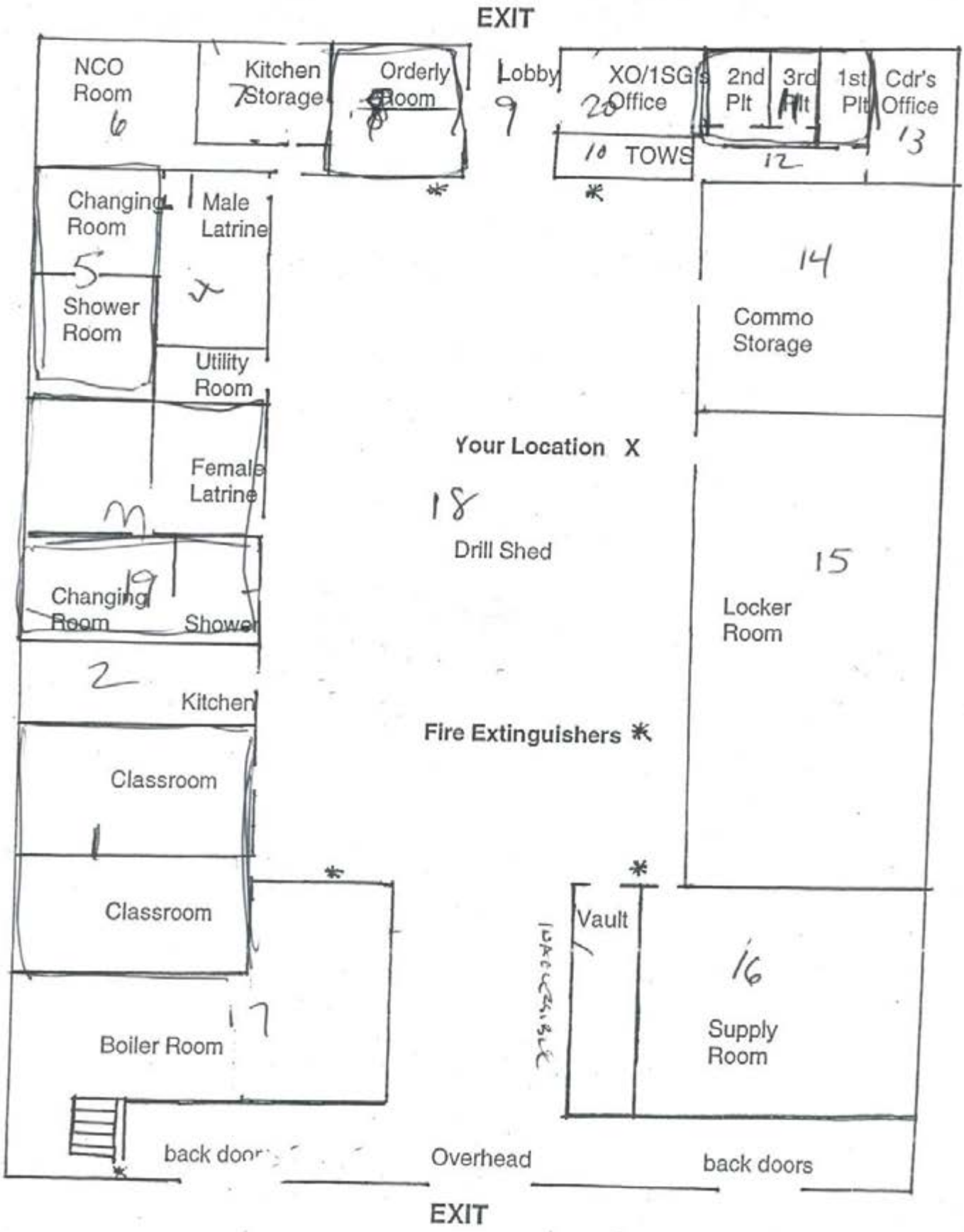
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential 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, August 23, 2007.
6. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 15, 1998.
7. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
8. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
9. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
10. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
11. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2007, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2004, "Thermal Environmental Conditions for Human Occupancy".
12. NIOSH website: http://www.cdc.gov/niosh/
13. OSHA website: http://www.osha.gov/.
14. Army CHPPM website: http://chppm-www.apgea.army.mil/.
15. EPA website: http://www.epa.gov.

Appendix A
Building Layout

FIRE EVACUATION PLAN



Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Braintree Readiness Center	**Chain Of Custody:**	508620
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Braintree, MA	**Date Submitted:**	8/23/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/30/2010
Attention:	Non-Responsive			**Report Date:**	8/30/2010

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
1073123	BRA-PB-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073124	BRA-PB-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073125	BRA-PB-03	Flame	Wipe	****	0.108	110	ug/ft²	12	110	ug/ft²	
1073126	BRA-PB-04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073127	BRA-PB-05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073128	BRA-PB-06	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
1073129	BRA-PB-07	Flame	Wipe	****	0.108	110	ug/ft²	2700	25000	ug/ft²	
1073130	BRA-PB-08	Flame	Wipe	****	0.108	110	ug/ft²	160	1400	ug/ft²	
1073131	BRA-PB-09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073132	BRA-PB-10	Flame	Wipe	****	0.108	110	ug/ft²	65	600	ug/ft²	
1073133	BRA-PB-11	Flame	Wipe	****	0.108	110	ug/ft²	77	720	ug/ft²	
1073134	BRA-PB-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073135	BRA-PB-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073136	BRA-PB-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073137	BRA-PB-15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073138	BRA-PB-16	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

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

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Braintree Readiness Center	**Chain Of Custody:**	508620
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Braintree, MA	**Date Submitted:**	8/23/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/30/2010
Attention:	Non-Responsive			**Report Date:**	8/30/2010

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)-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) 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 sampes.

NY ELAP accreditation applies only to paint chip, wipe, and soil samples.

Analys Non-Responsive

Technical Manager: Non-Responsive

OWI (410) 247-2024 159202 210 REV. 6.06

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) **508620**

p. 1/2

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: BRAINTREE READINESS CENTER
2. Job Location: BRAINTREE MA
3. Job #: PO #: W912K6-09-A-0003
4. Contact Pe[redacted]) 942-0273
5. Submitted [redacted]

Reporting Information (Results will be provid[redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: ___ ☐ 24 Hours Time Due: ___ Comments: ___	☐ Immediate ☐ Next Day ☐ 2 Day ☐ 3 Day ☒ 5 Day + Date Due: 8/30/10 ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Incl[redacted]with Report ☒ Em[redacted] ARIAENVIRO.COM ☐ Fax[redacted]@us.army.mil ☐ Ver[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 ___ (QTY)
- ☒ Pb Dust Wipe (wipe type GHOST) ~~13~~ 16 NLM (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 / **ANALYSIS** / **MATRIX**

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
BRA-PB-01		8/20/10		10X10cm				X				X				
BRA-PB-02		↓		↓				↓				↓				
BRA-PB-03																
BRA-PB-04																
BRA-PB-05																
BRA-PB-06																
BRA-PB-07																
BRA-PB-08																
BRA-PB-09																
BRA-PB-10																
BRA-PB-11																
BRA-PB-12		↓		↓				↓				↓				

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time: 8/24 1550 Contact: BS By: NPM
ADD the extra wipe samples to COC

Date/Time: ___ Contact: ___ By: ___

Date/Time: ___ Contact: ___ By: ___

LABORATORY STAFF ONLY (CUSTODY)
1. Date/Time RCVD: 8/23/10 @ 1015 Via: Fedex By (Print[redacted]
2. Date/Time Analyzed: ___/___/___ @ ___ By (Print): ___
3. Results Reported To: ___ Via: ___ Date: ___/___/___ Time: ___ Initials: ___
4. Comments: ___

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508620
p 2/2

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: SAME
2. Job Location:
3. Job #: [redacted]
4. Contact Pers[redacted]) 942-0273
5. Submitted by

Reporting Information (Results will be provided [redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: ☐ 24 Hours Time Due: Comments:	☐ Immediate ☐ 3 Day ☐ Next Day ☐ 5 Day + ☐ 2 Day Date Due: ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Include COC/Field Data Sheets with Report ☒ Email: @ ☐ Fax [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 ____ (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 ____) ____ (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 / **ANALYSIS** / **MATRIX**

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHERS	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
BRA-PB-13		8/20/10		10x10cm				X				X					Date/Time: Contact: By:
BRA-ASB-01							X				X						
BRA-ASB-02							X				X						
BRA-PB-14		8/20/10		10x10cm				X				X					Date/Time: Contact: By:
BRA-PB-15		|		|				|				|					
BRA-PB-16		|		|				|				|					
																	Date/Time: Contact: By:

NEW 8/20/10

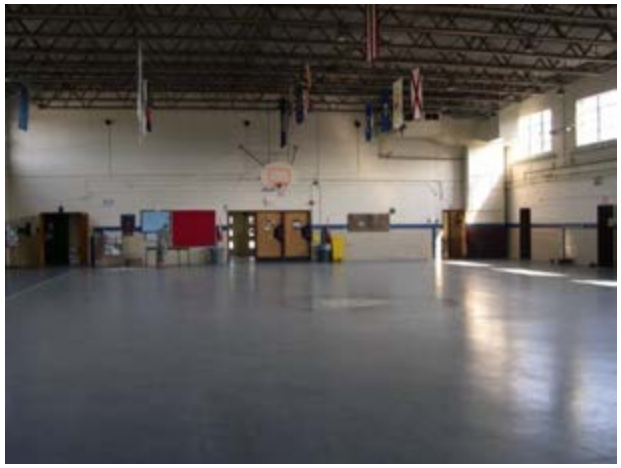
[redacted]

LABORATORY STAFF ONLY (CUSTODY)

1. Date/Time RCVD: ____ / ____ / ____ @ ____ Via: ____ By (Print): ____
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ Via: ____ Date: ____ / ____ / ____ Time: ____
4. Comments: ____

Appendix C
Photo Documentation

Braintree RC



Drill Hall

Mess Hall

Boiler Room

Boiler Room

Braintree RC

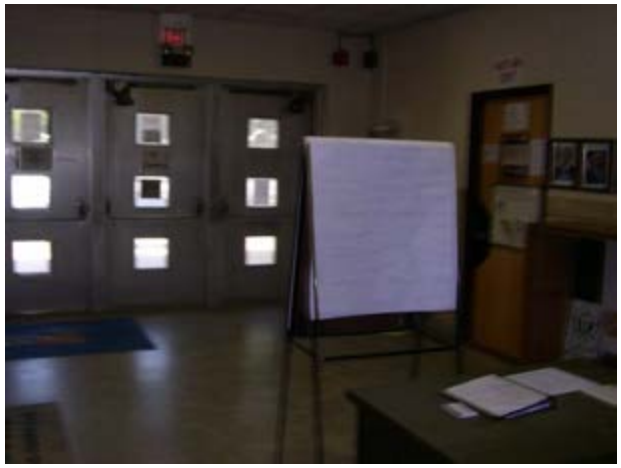
Boiler Room, Damaged TSI

Boiler Room, Damaged TSI

Storage Area

Locker Room, Former Firing Range

Braintree RC



Front Entry

Kitchen

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Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	**Braintree**	IAQ							Light		
Date	8/20/2010	Inspector	Non-Responsive	Instrument		TSI Q-Trak Plus Model 8554					Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		8554-02041015					Serial Number		K070277
Weather Conditions				Last Calibration		Mar-10					Last Calibration		30-Jul-10
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Value (fc)
1	Mess Hall			79.3	X	65.2	X	428		3.4		71.6		10
2	Kitchen			80.1	X	62.6	X	418		2.9		55.5		50
3	Womens Room			79.9	X	61.3	X	445		3.2		43.3		5
4	Mens Room			79.5	X	60.7	X	369		2.9		41.4		5
5	Mens Shower			79.7	X	60.1	X	422		2.7		94.2		5
6	Storage			79.5	X	60.6	X	412		2.8		19.1		10
7	Storage			77.5		56.4		444		2.7		35.0		10-30
8	Office			77.2		53.1		476		2.5		158.8		50
9	Lobby			76.3		60.3		398		2.5		64.1		10
10	Office			77.9		60.4		355		2.1		73.8		50
11	Office			77.9		61.2		334		2.3		238.1		50
12	Hall			78.1		62.0		372		2.3		33.7		5
13	Office			78.4	X	61.7	X	393		2.2		93.9		50
14	Storage/Readiness Room			78.3	X	61.5	X	341		2.3		83.8		30
15	Locker Room			78.4	X	61.0	X	347		2.2		71.3		7
16	Supply Room			79.7	X	59.2	X	390		2.4		99.5		30
17	Boiler Room			78.4	X	62.9	X	359		2.0		59.1		30
18	Drill Hall			78.3		59.6		322		1.9		66.4		30

Notes:

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°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

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	**Braintree**	IAQ							Light		
Date	8/20/2010	Inspector	Non-Responsive	Instrument		TSI Q-Trak Plus Model 8554					Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		8554-02041015					Serial Number		K070277
Weather Conditions				Last Calibration		Mar-10					Last Calibration		30-Jul-10
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Value (fc)
19	Storage			80.8	X	59.8	X	412		1.5		61.5		30
20	Office			78.4		54.5		403		1.0		55.2		50

Notes:

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°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

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
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
275 UNION STREET
BRAINTREE, MA 02184

June 17, 2013
PN: 39743799

Non-Responsive
Director, Industrial Hygiene Services

Non-Responsive
Project Manager

TABLE OF CONTENTS

APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
275 UNION ST., BRAINTREE, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in several locations tested.	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, arm rests and keyboards. Several wheeled chairs with 4 casters were noted.	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
Water Intrusion		
Water staining was observed on ceiling tiles and on the ceiling in the Unit Room.	The source of the water intrusion should be identified and repaired. The water-stained materials should be repaired or replaced (ACGIH – Guidelines for the Assessment of Bio-aerosols in the Indoor Environment).	RAC 3
Lead		
Five of the 10 lead wipe samples indicated elevated lead levels.	Items should be spot checked for lead contamination. 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
Emergency Exits		
Emergency exit signs and escape plans were not visible from all areas of the facility or illuminated.	Emergency exits should be properly illuminated (29 CFR 1910.37 (q)(6)).	RAC 3

Findings	Recommendations	Risk Assessment Code (RAC)
Asbestos		
Presumed asbestos-containing floor tiles and associated mastic were observed throughout the facility; an Asbestos Operation and Maintenance Program was not available on-Site.	Develop a site-specific asbestos operations and maintenance program for management of asbestos-containing materials in place as required by OSHA 29 CFR 1910.1001(j)(2).	RAC 4
PPE		
Hazard assessments have not been conducted to determine whether personal protective equipment is 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 4
Ladder Storage		
Ladders were not properly stored and secured.	Ladders not in use shall be properly stored in a vertical position fastened to walls (29 CFR 1910.25 (c)(2)(i)).	RAC 4
Hazard Communication		
Unlabeled chemicals/ flammable materials were observed in the flammables cabinet.	Each container of hazardous chemicals in the work place must be labeled with the identity of the chemical and appropriate hazard warnings (29 CFR 1910.1200).	RAC 3
Walking Surfaces		
Duct tape was securing tears in carpets and securing carpet at thresholds.	Flooring should be maintained in good repair to minimize uneven and slippery surfaces and tripping hazards (29 CFR 1910.22(b)(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 Readiness Center in Braintree, Massachusetts.

URS representative, Ms. Non-Responsive, conducted the Industrial Hygiene Survey on March 28, 2013. 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 mapping.

The Braintree Readiness Center is a one-story brick building, consisting of offices, classrooms, a supply area, a classroom, gender separate bathrooms, storage rooms, a kitchen, an Assembly Hall and a former Indoor Firing Range. A layout of the Readiness Center is provided in Appendix A.

GENERAL: The former Indoor Firing Range was posted as unsafe due to lead contamination, however is reportedly still accessed. Several areas of carpet had tears that were secured with duct tape. Duct tape was observed securing carpet at the threshold to the Training Storage room. Ladders were observed not properly stored and secured. Illuminated emergency exit signs were not observed throughout the facility. Emergency escape plans were not posted throughout the facility. Unlabeled chemicals/ flammable materials were observed in the flammable cabinet. Evidence of water intrusion was observed on ceiling tiles and the ceiling in the Unit Room.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in several of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress work areas must be lighted by at least the minimum light intensities.

LEAD: Five of the ten wipe samples collected in the Readiness Center were found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

On the day of the survey, none of the paint chip samples was found to contain a level of lead above the HUD criteria for determination of paint as lead-based.

ASBESTOS: Presumed asbestos-containing floor tiles and associated mastic were identified during this survey, however no Asbestos Operations and Maintenance Program was found on site. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. 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, keyboards, and monitors were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker.

Several wheeled chairs with four casters were observed throughout the facility.

NOISE: Personal noise monitoring levels in the Readiness Center determined that noise levels were below the OSHA permissible exposure limit (PEL) and Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and conducting administrative functions. The building includes offices, a classroom, a supply area, gender separate bathrooms, storage rooms, a classroom, a kitchen, an Assembly Hall and a former Indoor Firing Range.

The Readiness Center was found to be neat and organized at the time of URS' site visit.

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 Readiness Center. Interior carbon dioxide concentrations were found to be between 468 and 595 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (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 but is typically 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 444 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below 1144 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 Readiness Center was measured between 0.0 ppm and 1.2 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-Trak 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.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 30.1%, which was within the guideline of less than 65% recommended by ASHRAE.

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.

The average temperature inside the Readiness Center was, 70.4 °F, which was within the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Readiness Center 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 in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
Drill Hall, rear work table	Admin	**29.9**	50
Front Office, desk- [redacted]	Admin	74	50
Front Office, desk by windows	Admin	**28.2**	50
Training Storage, storage shelves	Storage	**16.4**	30
Unit Room, side computer desk	Admin	51.0	50
Unit Room, computer workstation towards corridor	Admin	56.3	50
Unit Room, front computer desk	Admin	54.6	50
Conference Room, desk- [redacted]	Admin	71.2	50
Corridor to conference room	Hall	**0.9**	5
Supply Room, middle desk	Admin	**35.0**	50
Supply Room, desk- [redacted]	Admin	151.1	50
Supply Room, work table	Admin	53.4	50
Classroom/ Break Room, break table	Break Room	37.3	30
Recruiter's Office, desk- [redacted]	Admin	**11.9**	50
Recruiter's Office, side desk	Admin	**12.3**	50

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in seven of the locations tested.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center 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 Readiness Center

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Break Room/ Classroom, wall at kitchen counter, towards door	Braintree RC Wipe-01	0.108	<110	200
Conference Room, floor under bookshelf between lockers	Braintree RC Wipe-02	0.108	<110	200
Latrine, Men's, floor at entry	Braintree RC Wipe-03	0.108	<110	200
Unit Room, floor, under middle window heater	Braintree RC Wipe-04	0.108	<110	200
Front Offices, Orderly Room, bookshelf by server, bottom shelf	Braintree RC Wipe-05	0.108	<110	200
Supply Room, rear wall, floor under window heater	Braintree RC Wipe-06	0.108	**800**	200
Drill Hall, floor by spill kit, towards rolling door	Braintree RC Wipe-07	0.108	**610**	200
Drill Hall, former Indoor Firing Range, floor at doorway	Braintree RC Wipe-08	0.108	**930**	200
Storage, floor, side of vault	Braintree RC Wipe-09	0.108	**630**	200
Vault, floor, rear corner towards rolling door	Braintree RC Wipe-10	0.108	**260**	200

ft^2 – Square foot
$\mu g/ft^2$ – Micrograms per square foot

Five of the ten surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

Two paint chip samples were collected from areas of peeling paint in the throughout the facility and were analyzed for lead content. The analytical report from AMA is contained in Appendix C.

According to the U.S. Department of Housing and Urban Development (HUD), paint is considered to be lead-based if the quantity of lead is greater than 0.5% by weight.

OSHA has not established a minimum percentage of lead to be defined as lead-based paint, therefore paint with lead in any amount above the analytical detection limit is considered to be lead-based under these regulations. The results of URS' lead paint testing are contained in Table 2-3.

Table 2-3
Lead Content in Painted Surfaces

Paint Location	Lead Concentration (Percent Weight)	HUD Lead-Based Quantity (Percent Weight)
Gray/ blue paint, floor of Supply Room	0.29	0.5
Red paint, interior, rolling door	0.03	0.5

On the day of the survey, neither of the paint chip samples was found to have a lead content above the HUD criteria for determination of paint as lead-based.

2.2.7 Asbestos

URS collected a total of three samples from damaged suspect friable asbestos-containing material (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 with dispersion staining (EPA-600/M4-82-020). Table 2-4 below shows the results of the asbestos sampling.

Table 2-4
Asbestos Bulk Sample Results – Supply Room

Sample Location	Sample Description	URS Sample Number	Result Total Asbestos
Supply Room, behind desk	Pipe Elbow Insulation	Braintree RC PLM-01A- 01C	Non-detect

The EPA states that any material with an asbestos content greater than 1% must be treated as ACM (EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA is contained in Appendix C.

Presumed asbestos-containing floor tiles and associated mastic were identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

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, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Personal noise dosimetry was conducted within the administrative office area. Personal exposures were measured using a data-logging Spark 703+ Noise Dosimeter. Personal noise dosimetry results indicated that, on the day of the survey, workers were not exposed to noise levels above the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 dBA/8-hour day. Table 2-5 indicates the individual monitored, the tasks performed and noise exposures.

Table 2-5
Noise Dosimetry Data

Location	Task	Sample Duration in Minutes	Monitoring Result TWA (dBA)*	Hearing Protection
Non-Responsive	Admin, equipment and material storage	361	81.0	N/A

* The calculated 8-hour, time-weighted average (TWA) noise exposure in dBA. The OSHA PEL for noise exposure is 90 dBA. DoDI 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 Readiness Center. Personal protective equipment included safety glasses, ear plugs and nitrile gloves.

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. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on personal noise dosimetry results and a review of normal site operations, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was identified on site. No operations were observed by URS that would require the use of respiratory protection.

3.4 Hazard Communication

A site-specific hazard communication program was identified on site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A written personal protective equipment program was not identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site.

3.7 Safety

The former Indoor Firing Range was posted as unsafe due to lead contamination, however is reportedly still accessed. Several areas of carpet had tears that were secured with duct tape. Duct tape was observed securing carpet at the threshold to Training Storage. Ladders were observed not properly stored and secured. Illuminated emergency exit signs were not observed throughout the facility. Emergency escape plans were not posted throughout the facility.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

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, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15

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

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)

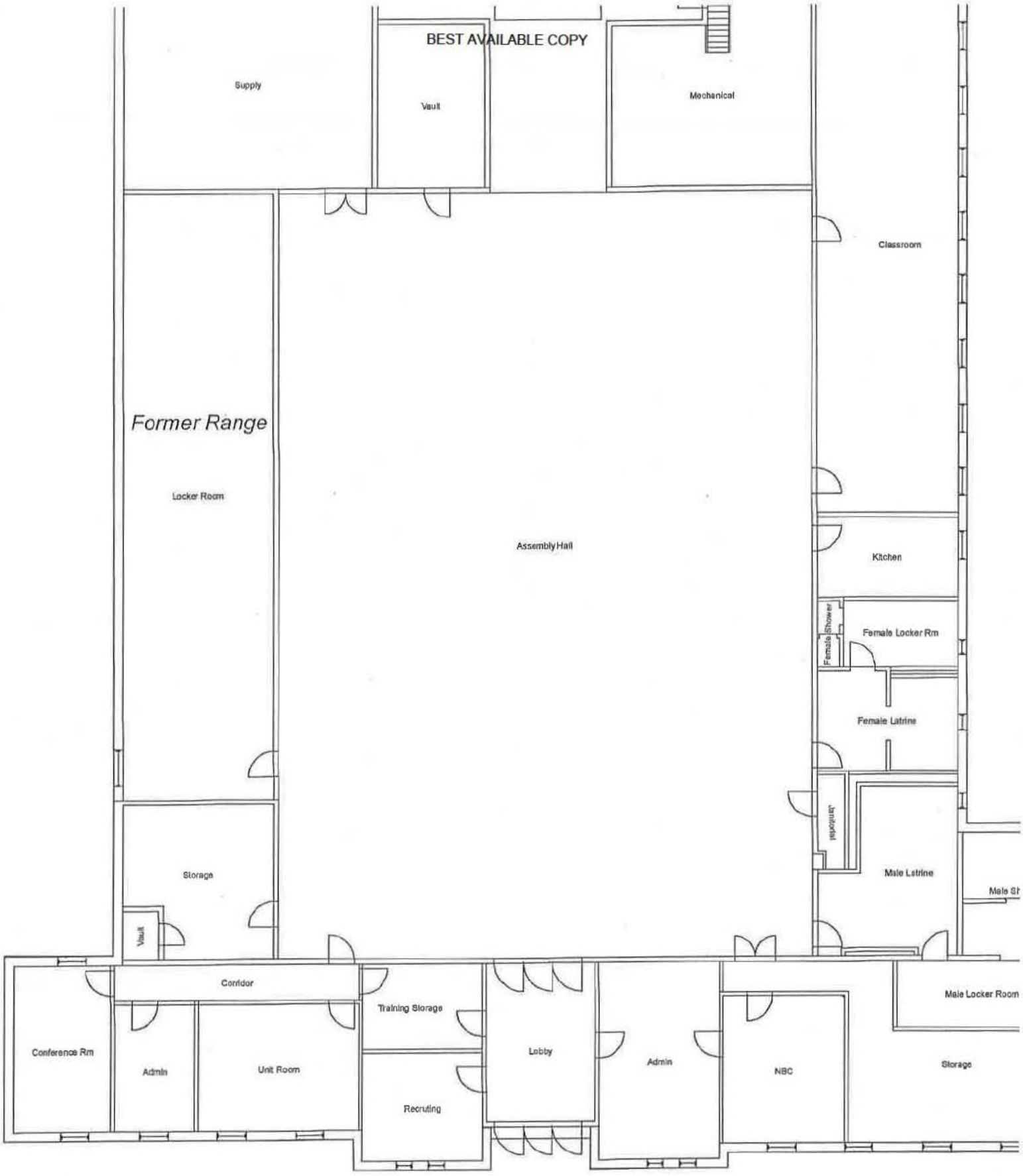
U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

APPENDIX A

SHOP DRAWING



APPENDIX B

PERSONNEL LIST

C 1-182 IN

275 Union ST

Braintree, MA 02184

Full Time Personnel

APPENDIX C

ANALYTICAL RESULTS

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:**	MA ARNG	**Chain Of Custody:**	515481
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	275 Union Street, Braintree, MA	**Date Submitted:**	4/1/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Braintree RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	[redacted]

Report Date: 4/8/2013

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
13049817	Braintree RC Wipe-01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13049818	Braintree RC Wipe-02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13049819	Braintree RC Wipe-03	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13049820	Braintree RC Wipe-04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13049821	Braintree RC Wipe-05	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13049822	Braintree RC Wipe-06	Flame	Wipe	****	0.108	110	ug/ft^2	86	800	ug/ft^2	
13049823	Braintree RC Wipe-07	Flame	Wipe	****	0.108	110	ug/ft^2	66	610	ug/ft^2	
13049824	Braintree RC Wipe-08	Flame	Wipe	****	0.108	110	ug/ft^2	100	930	ug/ft^2	
13049825	Braintree RC Wipe-09	Flame	Wipe	****	0.108	110	ug/ft^2	67	630	ug/ft^2	
13049826	Braintree RC Wipe-10	Flame	Wipe	****	0.108	110	ug/ft^2	28	260	ug/ft^2	
13049827	Braintree RC Wipe-FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515481
Address:	301-lH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	275 Union Street, Braintree, MA	**Date Submitted:**	4/1/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Braintree RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	4/8/2013

Report Date: 4/8/2013

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
13049828	Braintree RC LBP-01	Flame	Paint Chip	****	N/A	0.0065	%Pb		0.29	%Pb	
13049829	Braintree RC LBP-02	Flame	Paint Chip	****	N/A	0.007	%Pb		0.03	%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.

Ana Non-Responsive

Technical Manag Non-Responsive

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 Th Number For Inquires) 515481

pg 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: MA JABNG
2. Job Location: 275 Union Street, Braintree, MA
3. Job #: Braintree BC
4. Contact Perso[redacted] Non-Responsive
5. Submitted By: Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible): phone: Non-Responsive

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: 4/8/13
☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Include [redacted] with Report
☒ Email: Non-Responsive @irs.com
☐ Fax: [redacted] @us.army.mil
☐ Verbo[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 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 2 (QTY)
☒ Pb Dust Wipe (wipe type ghost) 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	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Braintree BC Wipe-01	Admin	3/28/13		100cm²				X				X				
Braintree BC Wipe-02								X				X				
Braintree BC Wipe-03								X				X				
Braintree BC Wipe-04								X				X				
Braintree BC Wipe-05								X				X				
Braintree BC Wipe-06	maintenance							X				X				
Braintree BC Wipe-07								X				X				
Braintree BC Wipe-08								X				X				
Braintree BC Wipe-09								X				X				
Braintree BC Wipe-10								X				X				
Braintree BC Wipe-FB	field blank			—				X				X				
Braintree BC PLM-01A	TSI elbow insulation						X				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: 4 / 1 / 13 @845 Via: FEDEX By (Print): Non-Responsive Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments: 7940 6954 8677

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OWI (410) 247-2024 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) 515481

pg 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: MA ARNG
2. Job Location: 275 Union Street, Braintree, MA
3. Job #: Braintree RC [redacted]
4. Contact P[redacted]
5. Submitted [redacted]

Reporting Information (Results will be provi[redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS			REPORT TO:
☐ Immediate Date Due: ______	☐ Immediate	☐ 3 Day	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	[redacted] with Report
☐ 24 Hours Time Due: ______	☐ Next Day	☒ 5 Day +		[redacted] .com
Comments: ______	☐ 2 Day	Date Due: ______		☐ 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 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 2 (QTY)
- ☒ Pb Dust Wipe (wipe type ghost) 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)

SAMPLE INFORMATION / **ANALYSIS** / **MATRIX**

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
Braintree RC PLM-01B	TSI elbow insulation	3/28/13					X				X						Date/Time: Contact: By:
Braintree RC PLM-01C	TSI elbow insulation	|					X				X						
Braintree RC LBP-01	gray/blue paint	|						X			X						
Braintree RC LBP-02	red paint	|						X			X						
																	Date/Time: Contact: By:
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: ____ / ____ / ____ @ ____ Via: ____ By (Print): ____ Sign: ____
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ Via: ____ Date: ____ / ____ / ____ Time: ____ Initials: ____
4. Comments: ____

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515481
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	275 Union Street, Braintree, MA	**Date Analyzed:**	4/8/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Braintree RC	**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
13049830	Braintree RC PLM-01A	NAD	--	--	--	--	40	--	TR	--	--	60	Elbow	Gray	Homogeneous	SW	
13049831	Braintree RC PLM-01B	NAD	--	--	--	--	40	--	TR	--	--	60	Elbow	Gray	Homogeneous	SW	
13049832	Braintree RC PLM-01C	NAD	--	--	--	--	40	--	TR	--	--	60	Elbow	Gray	Homogeneous	SW	

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515481
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	275 Union Street, Braintree, MA	**Date Analyzed:**	4/8/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Braintree RC	**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 Director Non-Responsive **Analyst(s)** Non-Responsive

BEST AVAILABLE COPY

OW (410) 247-2024

159203 .... 210 REV 8.00

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 TI Number For Inquires) **515481**

pg 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: MA ARNG
2. Job Location: 275 Union Street, Braintree, MA
3. Job #: Braintree RC [redacted]
4. Contact Person [redacted]
5. Submitted By: [redacted]

Reporting Information (Results will be provided as soon as technically feasible): → phone: [redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS			REPORT TO:
☐ Immediate Date Due: ____	☐ Immediate	☐ 3 Day	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Inclu[redacted] with Report
☐ 24 Hours Time Due: ____	☐ Next Day	☒ 5 Day +		☒ E-mail [redacted] urs.com
Comments:	☐ 2 Day	Date Due: 4/8/13		☐ Fax: [redacted] @us.army.mil
				☐ Verbal [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 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 2 (QTY)
- ☒ Pb Dust Wipe (wipe type ghost) 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)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Braintree RC Wipe-01	Admin	3/28/13		100cm²				X				X				
Braintree RC Wipe-02								X				X				
Braintree RC Wipe-03								X				X				
Braintree RC Wipe-04								X				X				
Braintree RC Wipe-05								X				X				
Braintree RC Wipe-06	maintenance							X				X				
Braintree RC Wipe-07								X				X				
Braintree RC Wipe-08								X				X				
Braintree RC Wipe-09								X				X				
Braintree RC Wipe-10								X				X				
Braintree RC Wipe-FB	field blank			—				X				X				
Braintree RC PLM-01	TSI elbow insulation						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: 4/1/13 0845 Via: FED [redacted]
2. Date/Time Analyzed [redacted] 4/8/13 @ ____ By (Print): ____
3. Results Reported To [redacted] BEST AVAILABLE COPY Date: 4/8/13 Initials: ____
4. Comments: 7940 6954 8677

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) 942-0264

Submittal Information:
1. Job Name: MA ARNG
2. Job Location: 275 Union Street, Braintree, MA
3. Job #: Braintree RC
4. Contact Pe[redacted]
5. Submitted [redacted]

Non-Responsive Non-Responsive

Reporting Information (Results will be provid[redacted])

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPO[redacted]
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	[redacted] with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	Non-Responsive .mil
Comments:	☐ 2 Day Date Due:	.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	

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)
- ☐ Gray. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

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

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 GhOST) 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	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Braintree RC PLM-01	TSI elbow insulation	3/28/13					X				X					
Braintree RC PLM-02	TSI elbow insulation						X				X					
Braintree RC LBP-01	gray/blue paint							X			X					
Braintree RC LBP-02	red paint							X			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: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

APPENDIX D

PHOTOGRAPHIC LOG

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Braintree RC	275 Union St., Braintree, MA	39743799

Photo No.	Date:
1	3/28/13

Description:

Unlabeled containers in the flammable cabinet.

Photo No.	Date:
2	3/28/13

Description:

Evidence of water intrusion in ceiling of Unit Room.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Braintree RC	275 Union St., Braintree, MA	39743799

Photo No.	Date:
3	3/28/13

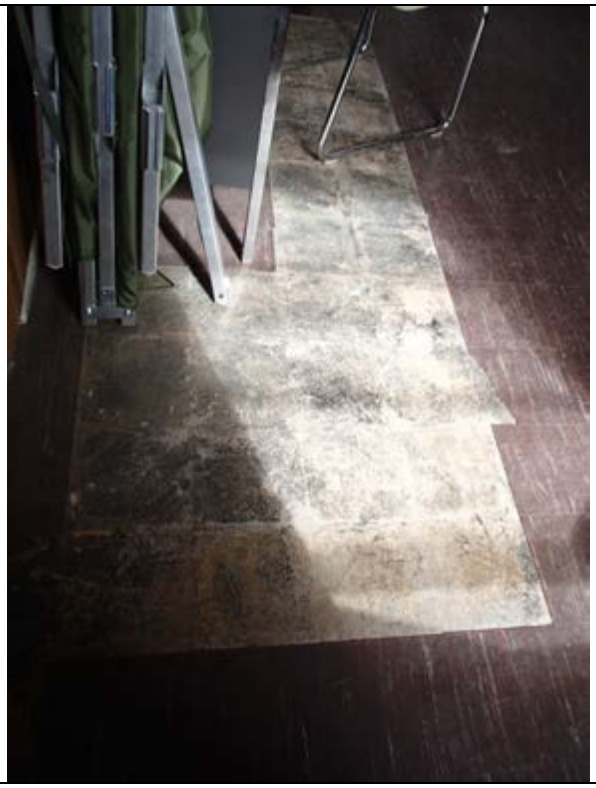
Description:

Ladders not properly secured and stored.

Photo No.	Date:
4	3/28/13

Description:

Damaged presumed asbestos-containing floor tiles in Conference Room.



APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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

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.

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
BRIDGEWATER READINESS CENTER
576 BEDFORD STREET
BRIDGEWATER, MASSACHUSETTS

Non-Responsive
Office Manager

Non-Responsive
Project Manager

July 2005
PN: 39741508

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

APPENDICES

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 most 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
Lead		
Lead was detected in wipe samples collected from the window sill 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 where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025 (h)(1))	RAC 4
Asbestos		
Broken asbestos containing floor tile was found throughout the building. Exposed asbestos pipe insulation was found in various locations.	Remove and replace the broken floor tile with non-asbestos replacement floor tiles. Repair or remove exposed asbestos pipe insulation. 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 was not available.	Develop a site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
The hazard communication plan available was not site specific.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910. 1200(e))	RAC 4
Unlabelled secondary container observed in janitor's closet	Label all secondary containers not intended for immediate use (OSHA 29 CFR 1910.1200(f))	
Electrical Safety		
The electrical panel box was blocked in room #9	Remove electrical box obstructions and keep work space clear for at least 30 inches from electrical panels (OSHA 29CFR 1910.303 (g)(1)(i)).	RAC 3
An exposed electrical power outlet was found in office #3	Cover electrical outlet with approved outlet cover (OSHA 1910.305 (b)(2))	RAC 2

1.0 SUMMARY

At the request of the National Guard Bureau Region North Industrial Hygiene Office (NGB), URS Corporation (URS) conducted an industrial hygiene survey at the Readiness Center located at 576 Bedford Street in Bridgewater, Massachusetts. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On February 11, 2004, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Readiness Center in Bridgewater, Massachusetts. 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. Mr. Non-Responsive of the State of Massachusetts was Mr. Non-Responsive site contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

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. Computer workstation chairs could not be adjusted for height, the armrests were in a fixed position and keyboards could not be adjusted (Photo # 3725). Computer monitors could not be adjusted for different individuals working at the work stations. If more than one person is using that station, then proper adjustments need to be made to accommodate each person.

The electrical panel box was blocked in room #9 (Photo # 3724).

An exposed electrical power outlet was found in office #3 (Photo # 3727).

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 20.1 – 28.1% with an average of 21.4%. This average reading was below the recommended levels of between 30.0% and 60.0% set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ANSI / ASHRAE Standard 55-2004).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 400 to 459 parts per million (ppm), with an average of 417 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 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 background level. Given a background level of 350 ppm on the day of the survey, the ASHRAE limit would be 1050 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide levels were also measured in the Readiness Center. Carbon monoxide concentrations remained at 0 parts per million (ppm) throughout the survey period. 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 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. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

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 Illuminance (lux)	Recommended Illuminance (lux)
Office # 1	Administrative Duties	571	500
Office # 2	Administrative Duties	815	500
Office # 3	Administrative Duties	386	500
Office # 5	Administrative Duties	289	500
Office # 6	Administrative Duties	236	500
Office # 7	Administrative Duties	241	500
Office # 9	Administrative Duties	506	500
Lobby # 8	Accessway	372	30

On the day of the survey the illuminance in the administrative area was inadequate in fifty percent of the offices.

2.2.5 Lead

One paint chip was collected where paint was peeling and sent to AMA Analytical Services, Inc. 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 Laad-Based Paint Hazard Reduction Act of 1992 (also referred to as Title X)). Table 2-2 below shows the results of the laad paint testing.

Table 2-2
Level of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Room # 15	0211-LPC04	0.01	0.11

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 Safe Surface Contamination Level ($\mu g/ft^2$)
Kitchen – Top of Refrigerator	0211-LW11	1.000	15	200
Men's Room – Top of Bench	0211-LW12	1.000	20	200
Office #6 – Top of Locker	0211-LW13	1.000	120	200
Office #2 – Window Sill	0211-LW14	1.000	440	200
Room #25- Floor	0211-LW15	1.000	17	200
Blank	0211-LWBlank2	N/A	<12 µg	N/A

The analytical raport from AMA is contained in Appendix D.

2.2.6 Asbestos

Bulk samplas 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 2-3 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 (%)
Kitchen # 22	9"x9" Brown Floor Tile	0211-AB02A	2
Kitchen # 22	9"x9" Brown Floor Tile	0211-AB02B	2
Mess Hall # 23	Window Glazing	0211-AB03A	TR
Men's Room # 16	Window Glazing	0211-AB03B	2
Classroom # 11	9"x9" Red Floor Tile	0211-AB04A	2
Classroom # 11	9"x9" Red Floor Tile	0211-AB04B	2
Office # 9	9"x9" Gray Floor Tile	0211-AB05A	3
Office # 9	9"x9" Gray Floor Tile	0211-AB05B	3
Office # 3	9"x9" Black Floor Tile	0211-AB06A	NAD
Office # 3	9"x9" Black Floor Tile	0211-AB06B	NAD

NAD = "No Asbestos Detected"
TR = "Trace Amount of Asbestos" (Less than 1%)

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.

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.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in most offices.

LEAD: One surface dust wipe sample contained lead greater than the 200 microgram per square foot limit set by the NGB (see Appendix G). Personnel trained in accordance with the OSHA lead standard (29 CFR 1910.1025) should thoroughly clean the building's window sill and wells.

ASBESTOS: Samples of the 9"x9" floor tile that was present throughout this building area were determined to contain asbestos in a concentration greater than one percent (Photos # 3712, 3721, 3723 & 3730). Exposed asbestos-containing pipe insulation was found in kitchen # 22 (Photo # 3713), mess hall # 23 (Photo # 3714), men's room #16 (Photo # 3717), room # 12A (Photo # 3718-19), classroom # 11 (Photo # 3720), office # 3 (Photo # 3728), room # 2 (Photo # 3729) and in hallway # 25A (Photo # 3731). The asbestos-containing window glazing was loose and falling apart from the windows in the mess hall # 23 (Photo # 3715). It is recommended that the damaged floor tile be replaced with new, non-asbestos tile. The exposed pipe insulation and window glazing need to be removed or repaired. This work should to be performed by an appropriately trained technician.

HAZARD COMMUNICATION: A bottle containing blue liquid found in the janitor's room # 18 was not labeled (Photo # 3716).

ELECTRICAL: The electrical panel box was blocked in room #9. Electrical panels are required to be free from obstruction.

An exposed electrical power outlet was observed in office #3.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The 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 Safe Surface Contamination Level ($\mu g/ft^2$)
Former Firing Range-Top of the Roof Drain Pipe	0211-LW06	1.000	5,300	200
Former Firing Range-Top of a Light Guard	0211-LW07	1.000	11,000	200
Former Firing Range-Floor-Rear	0211-LW08	1.000	2,400	200
Former Firing Range-Floor-Center	0211-LW09	1.000	1,500	200
Former Firing Range-Floor-Front	0211-LW10	1.000	2,600	200
Blank	0211-LWBlank	N/A	<12	200

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
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	0211-LA02	892	<3.4	50.0
Blank	0211-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the former firing range was found to be accepteble, 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.

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: The five surface wipe samples collected in the former firing range were found to contain lead dust levels above the maximum limit set by the National Guard Bureau (See Appendix G). The indoor firing range should be cleaned in accordance with the Policy And Responsibilities For Inspection, Evaluation And Operation of ARNG Indoor Firing Ranges (IFR) And Guidelines For IFR Rehabilitation, Conversion And Cleaning (Appendix H).

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 7,300 square foot area with about a 30-foot high ceiling used for assembling personnel and storing equipment. The walls are constructed of cinder-block 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 Safe Surface Contamination Level ($\mu g/ft^2$)
Drill Hall # 24 – Top of the Coca-Cola Machine	0211-LW01	1.000	140	200
Drill Hall # 24 – Top of a Locker	0211-LW02	1.000	77	200
Drill Hall # 24 – Top of the Flammable Storage Cabinet	0211-LW03	1.000	31	200
Drill Hall # 24 – Floor – Reer	0211-LW04	1.000	63	200
Drill Hall # 24 – Floor – Front	0211-LW05	1.000	<12	200
Blank	0211-LWBlank	N/A	<12	200

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

Table 4-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL ($\mu g/m^3$)
Drill Hall # 24	0211-LA01	900	<3.3	50.0
Blank	0211-LA03	0	<3.0	50.0

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 50.0 $\mu g/m^3$ 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: The air and dust wipe samples collected in the drill hall for lead were found to be within allowable limits and require no further action at this time.

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

Paint chips were collected in the boiler room where paint was peeling and sent to AMA for analysis. The 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 Act of 1992 (also referred to as Title X)). Table 5-1 below shows the results of the lead paint testing.

Table 5-1
Levels of Lead in Paint Found in the Boiler Room

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room # 30	0211-LPC01	0.01	<0.0096
Boiler Room # 30	0211-LPC02	0.01	0.37
Boiler Room # 30	0211-LPC03	0.01	0.044

The analytical report from AMA is contained in Appendix D.

5.2.2 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 5-2 below presents the results of the sample analysis.

Table 5-2
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Boiler Room # 30	Pipe Insulation	0211-01A	NAD
Boiler Room # 30	Pipe Insulation	0211-01B	70
Boiler Room # 30	Pipe Insulation	0211-01C	75

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.

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 paint chip samples collected in the boiler room were found to contain levels of lead within the acceptable range of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines.

ASBESTOS: There was exposed pipe insulation in the boiler room at the time of this survey (Photos # 3706-07 & 3709). It is recommended that the exposed sections be removed or repaired. The work should be performed by an appropriately trained licensed technician.

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 likely 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 likely 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 likely not required for this site.

6.4 Hazard Communication

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

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 62-2001: Ventilation for Acceptable Indoor Air Quality

Army Corps of Engineers

Safety and Health Requirements Manual EM 385-1-1 November 2003

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 Ideat 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)

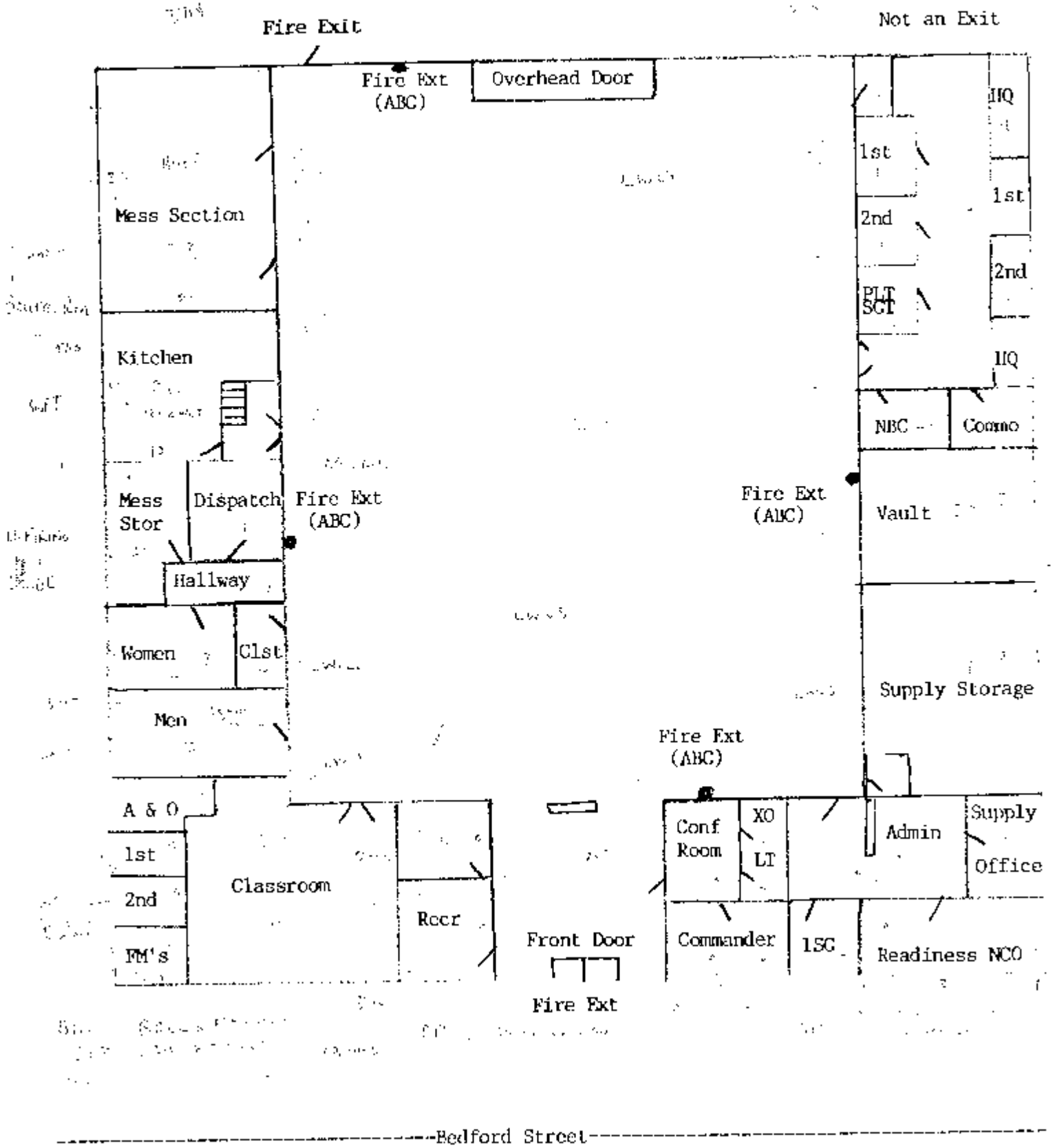
U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

APPENDIX A

SHOP DRAWING

Co C Fire Exit Plan and Fire Extinguisher Plan



APPENDIX B

PERSONNEL LIST

PERSONEL LIST
BRIDGEWATER ARMORY

Name	Rank
Non-Responsive	SFC
	SSG
	SSG

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122963
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	576 Bedford St. Bridewater, MA	**Date Analyzed:**	02/24/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	24-Feb-04
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
0426223	0211-LA 01	Flame	Air	900	N/A	3.33	ug/m³	<	3.3	ug/m³	
0426224	0211-LA 02	Flame	Air	892	N/A	3.36	ug/m³	<	3.4	ug/m³	
0426225	0211-LA 03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	
0426226	0211-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	<	0.0096	%Pb	
0426227	0211-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb		0.37	%Pb	
0426228	0211-LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb		0.044	%Pb	
0426229	0211-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb		0.11	%Pb	
0426230	0211-LW 01	Flame	Wipe	****	1.000	12.00	ug/ft²		140	ug/ft²	
0426231	0211-LW 02	Flame	Wipe	****	1.000	12.00	ug/ft²		77	ug/ft²	
0426232	0211-LW 03	Flame	Wipe	****	1.000	12.00	ug/ft²		31	ug/ft²	
0426233	0211-LW 04	Flame	Wipe	****	1.000	12.00	ug/ft²		63	ug/ft²	
0426234	0211-LW 05	Flame	Wipe	****	1.000	12.00	ug/ft²	<	12	ug/ft²	
0426235	0211-LW 06	Flame	Wipe	****	1.000	12.00	ug/ft²		5300	ug/ft²	
0426236	0211-LW 07	Flame	Wipe	****	1.000	12.00	ug/ft²		11000	ug/ft²	
0426237	0211-LW 08	Flame	Wipe	****	1.000	12.00	ug/ft²		2400	ug/ft²	
0426238	0211-LW 09	Flame	Wipe	****	1.000	12.00	ug/ft²		1500	ug/ft²	
0426239	0211-LW 10	Flame	Wipe	****	1.000	12.00	ug/ft²		2600	ug/ft²	
0426240	0211-LW BLANK	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	

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AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122963
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	576 Bedford St. Bridewater, MA	**Date Analyzed:**	02/24/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	24-Feb-04

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

Analyst: [redacted] l Manager: [redacted]

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122963
Address:	301-III Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	576 Bedford St. Bridewater, MA	**Date Analyzed:**	2/24/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**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	Analyst ID	Comments
0426241	0211-AB 01 A	NAD	--	--	--	--	--	--	--	--	5	95	Gray	LB	
0426242	0211-AB 01 B	70	70	--	--	--	--	--	20	--	--	10	Gray	LB	
0426243	0211-AB 01 C	75	75	--	--	--	--	--	5	--	--	20	Gray	LB	
0426244	0211-AB 02 A	2	2	--	--	--	--	--	--	--	--	98	Brown	LB	
0426245	0211-AB 02 B	2	2	--	--	--	--	--	TR	--	--	98	Brown	LB	
0426246	0211-AB 03 A	TR	TR	--	--	--	--	--	--	--	--	100	Gray	LB	
0426247	0211-AB 03 B	2	2	--	--	--	--	--	--	--	--	98	Gray	LB	
0426248	0211-AB 04 A	2	2	--	--	--	--	--	--	--	--	98	Red	LB	
0426249	0211-AB 04 B	2	2	--	--	--	--	--	--	--	--	98	Red	LB	
0426250	0211-AB 05 A	3	3	--	--	--	--	--	--	--	--	97	Gray	LB	
0426251	0211-AB 05 B	3	3	--	--	--	--	--	--	--	--	97	Gray	LB	
0426252	0211-AB 06 A	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0426253	0211-AB 06 B	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	

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.

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122963
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	576 Bedford St. Bridgewater, MA	**Date Analyzed:**	2/24/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**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	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]

An AIHA (#6863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

NVLAP 101143-0 | NY ELAP 10920 | AIHA 100470

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	Job Name:	Armory	Chain Of Custody:	138229		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	Job Location:	Bridgewater, MA	Date Submitted:	5/20/2005		
	Havre de Grace, Maryland 21078	Job Number:	Not Provided	Person Submitting:			
		P.O. Number:	Not Provided	Date Analyzed:	5/25/2005	Report Date:	25-May-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
0540475	0211-LW11	Flame	Wipe	****	1.000	12.00 ug/ft²	15 ug/ft²	
0540476	0211-LW12	Flame	Wipe	****	1.000	12.00 ug/ft²	20 ug/ft²	
0540477	0211-LW13	Flame	Wipe	****	1.000	12.00 ug/ft²	120 ug/ft²	
0540478	0211-LW14	Flame	Wipe	****	1.042	11.52 ug/ft²	440 ug/ft²	
0540479	0211-LW15	Flame	Wipe	****	1.000	12.00 ug/ft²	17 ug/ft²	
0540480	0211-LW Blank2	Flame	Wipe Blank	****	N/A	12.00 ug	< 12 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]

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory

4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0963 • Fax (301) 459-2643

APPENDIX E

TRAINING CERTIFICATES

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 as:

Asbestos Inspector Refresher

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

April 11, 2003
Course Dates

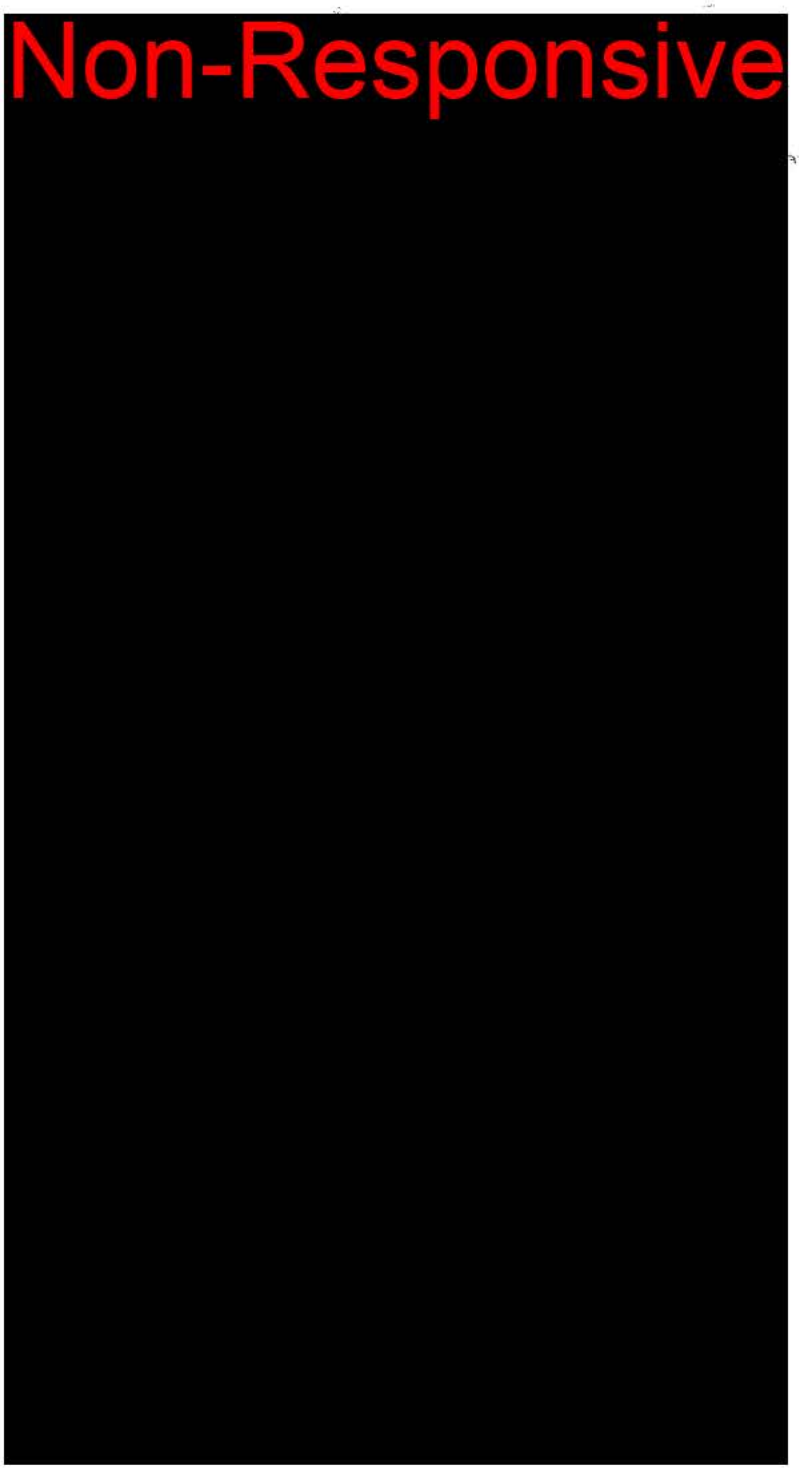
Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

03518010625349
Certificate Number

April 10, 2004
Expiration Date

[redacted]
President/Director of Training


Non-Responsive

APPENDIX F

PHOTOGRAPHS

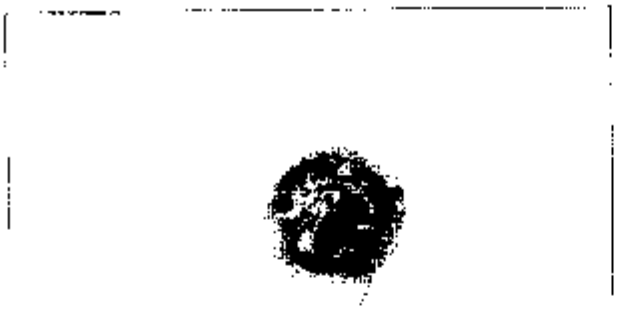


Photo 3706: Boiler Room #30 Puncture hole in asbestos-containing boiler exhaust pipe

Photo 3707: Boiler Room #30 Damaged asbestos-containing pipe insulation

Photo 3708: Boiler Room #30 - Damaged asbestos-containing pipe insulation

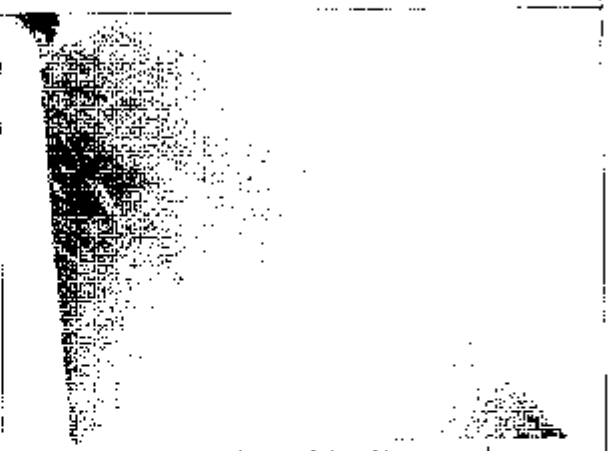


Photo 3712: Kitchen #22 Damaged asbestos-containing floor tile

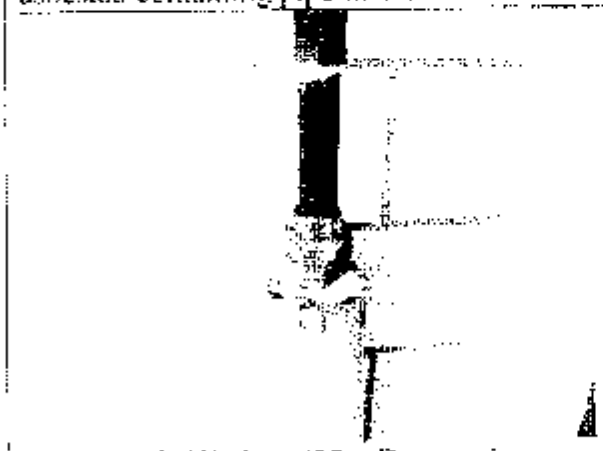


Photo 3713: Kitchen #22 Damaged asbestos-containing pipe insulation

Photo 3714: Mess Hall #23 - Damaged asbestos-containing pipe insulation

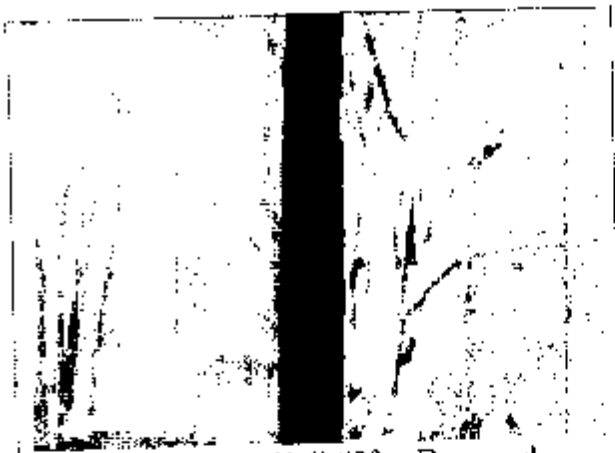


Photo 3715: Mess Hall #23 Damaged window glazing

Photo 3716: Janitor's Room #18 Unlabelled secondary container

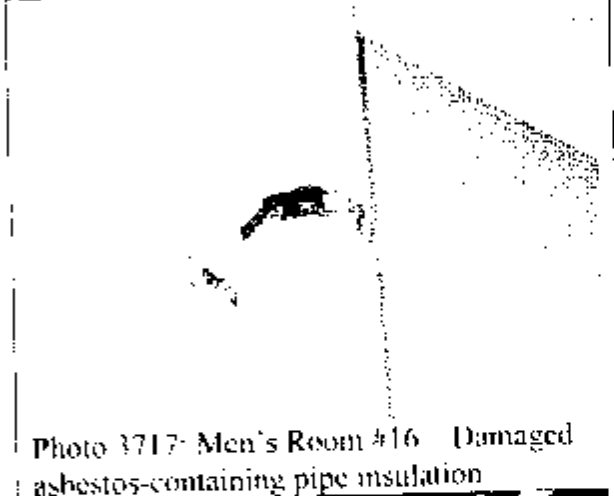


Photo 3717: Men's Room #16 Damaged asbestos-containing pipe insulation

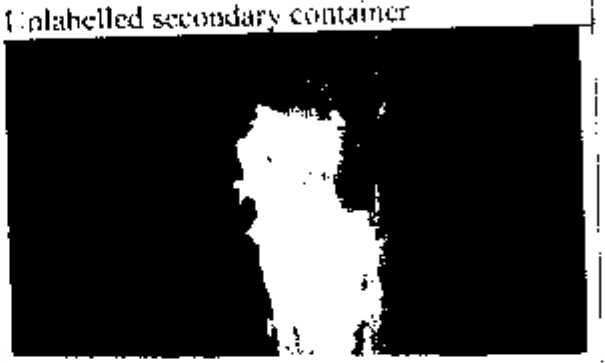
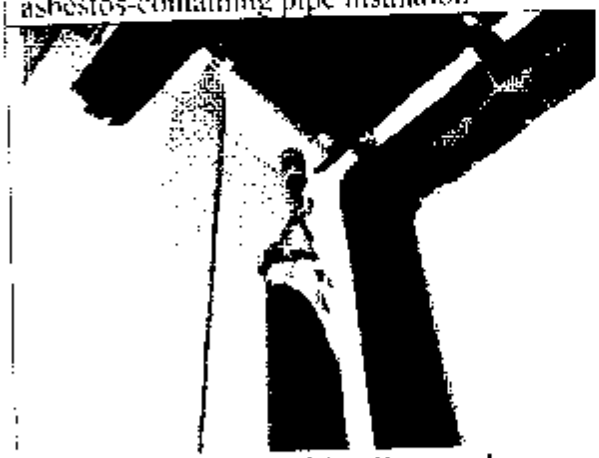


Photo 3718: Room 12A Damaged asbestos-containing pipe insulation



Room 3719: Room 12A Damaged asbestos-containing pipe insulation

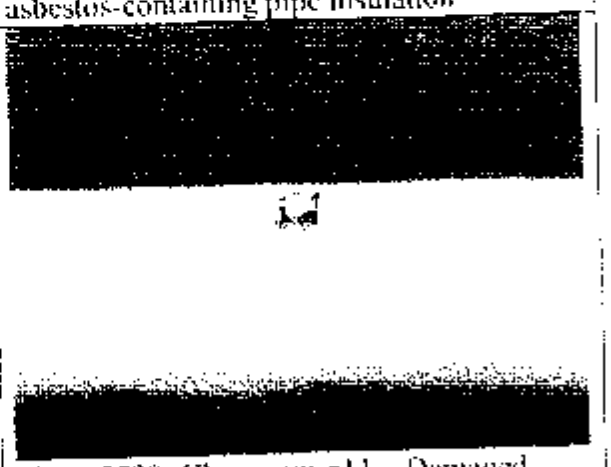


Photo 3720: Classroom #11 Damaged asbestos-containing pipe insulation

Photo 3721: Classroom #11 Damaged asbestos-containing floor tile

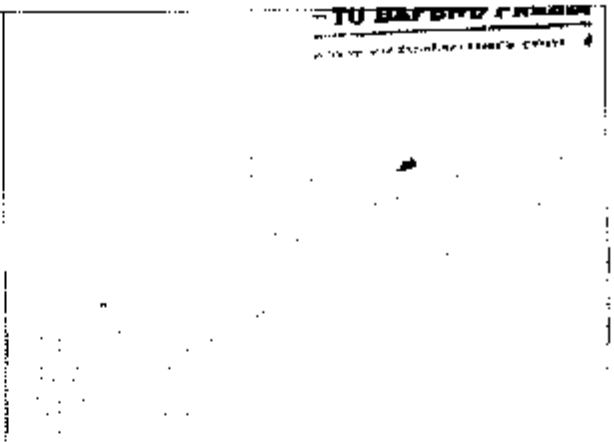


Photo 3723: Room #9 Damaged asbestos-containing floor tile

Photo 3724: Room #9 Obstructed electrical panel

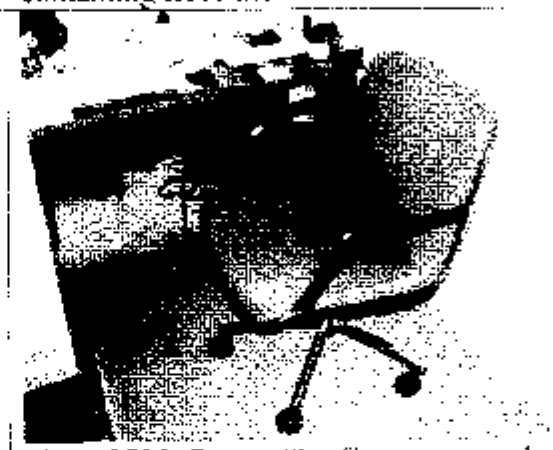


Photo 3725: Room #9 Computer work station chair

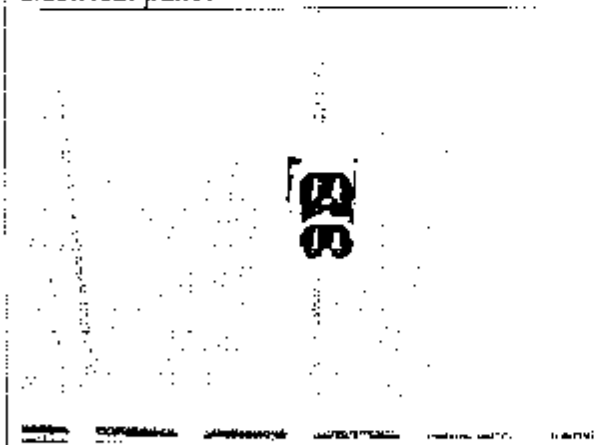


Photo 3727: Commander's Office #3 Exposed electrical outlet

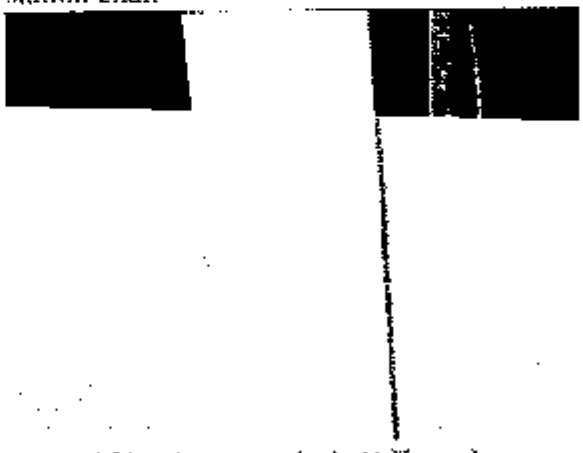


Photo 3728. Commander's Office #3 Damaged asbestos-containing pipe insulation

Photo 3729: Room #2 Damaged asbestos-containing pipe insulation

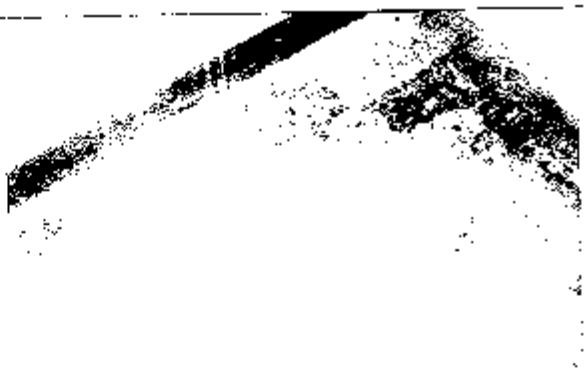


Photo 3730: Room #1 Exposed asbestos-containing floor tile mastic

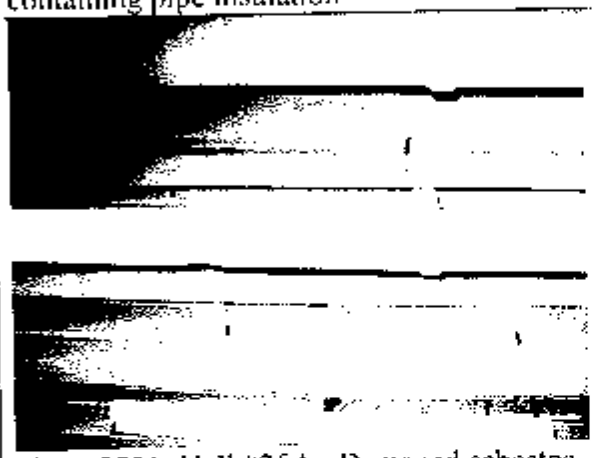


Photo 3731: Hall #25A Damaged asbestos-containing pipe insulation

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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.

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.

APPENDIX H

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATIONOF ARNG INDOOR FIRING RANGES (IFR) AND GUIDELINES FOR IFR REHABILITATION, CONVERSION AND CLEANING

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
NATIONAL GUARD BUREAU
1411 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202-3231

5 December 2001

NGB-AVS

MEMORANDUM FOR THE ADJUTANTS GENERAL OF ALL STATES, PUERTO RICO, THE US VIRGIN ISLANDS, GUAM, AND THE COMMANDING GENERAL OF THE DISTRICT OF COLUMBIA

SUBJECT: (All States Log Number P01-0075) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning

1. References:

a. AR 385-63, Policy and Procedures, 15 November 1983.

b. DODI 6055.9-STD, DOD Ammunition and Explosive Safety Standards, August 1997.

c. DODIG Report #98-170, subject: ARNG and U.S. Army Reserve Command Small Arms IFR, 30 June 1998.

d. AR 385-10, The Army Safety Program, 29 February 2000.

e. All States Memorandum, NGB-AVS, 18 September 2000, subject: (All States Log Number P00-0059) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges.

2. The policy and procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges are enclosed. Guidelines for Rehabilitation, Conversion, and Cleaning of IFRs are provided in the Addendum. These policies apply to all persons responsible for the operation, rehabilitation, conversion, and cleaning of ARNG IFR and satisfy the requirements of the references listed above.

3. The enclosed document contains sample formats of the forms necessary for the routine operation of IFRs. Additionally, an IFR Standing Operating Procedure is provided to assist each State/Territory in developing local guidance consistent with the needs of the individuals that use their range(s).

4. The contents of this memorandum will be incorporated into the revision of NGR 385-15, Policy and Responsibilities for Evaluation, and Operation of ARNG Indoor Firing Ranges, and National Guard Pamphlet 385-15, Guidance and Procedures for IFR Rehabilitation, Conversion, and Cleaning.

NGB-AVS
SUBJECT: (All States Log Number P01-0075) Army National Guard (ARNG) - Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR) and Guidelines for IFR Rehabilitation, Conversion and Cleaning Inspection

5. This memorandum expires 30 November 2002, unless sooner rescinded or superseded.

6. Point of contact is Colonel Non-Responsive Chief, Aviation and Safety Division, at DSN 327-7700 or 703-607-7700.

FOR THE CHIEF, NATIONAL GUARD BUREAU:

Non-Responsive

Encl
as

Lieutenant General, GS
Director, Army National Guard

CF:
NGB-IG
NGB-ART
NGB-ARO
NGB-ARE
NGB-ARI
NGB-ARS
NGB-PL
NGB-ARZ-PC
Each State IG
Each State Safety Office
Each State Occupational Health Nurse
Each State Training Site Commander
Each State USPFO
Each Regional Industrial Hygienist

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

Safety

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Contents

1-1. General
This policy prescribes Army National Guard (ARNG) policy and responsibilities for inspection, evaluation and operation of ARNG indoor firing ranges. It applies to all training, maintenance, and firing activities conducted on indoor firing ranges. This policy supplements AR 385-10, AR 385-63, and AR 385-64.

1-2. Explanation of abbreviations and terms
Abbreviations used in this publication are listed in Appendix A. Terms that apply specifically to IFRs can be found in paragraph 1-37 of this regulation.

1-3. Policy
a. Ammunition shall only be fired in properly classified indoor firing ranges.
b. Detailed initial and periodic inspections of all indoor firing ranges shall be conducted as prescribed to ensure compliance with current safety and health standards.
c. ARNG or civilian personnel shall not use any indoor firing range, which has been classified as unsafe.
d. A DA Form 4753, Notice of Unsafe or Unhealthy Working Condition, shall be posted on the entrance to all ranges classified as unsafe.
e. Ranges classified as unsafe shall be secured, sufficiently to preclude entry.
f. New ranges shall be designed using the latest standards provided by NGB-ARI.
g. The use of indoor firing ranges for purposes other than small arms weapons training and target practice is strictly *prohibited*.

Responsibilities

1-4. Director, Army National Guard (DARNG)
The Director, Army National Guard establishes policy and provides resources necessary to implement the ARNG Range Safety program per AR 385-63.

1-5. Chief, Aviation and Safety (NGB-AVS)
The Chief, NGB-AVS, has staff responsibility for supervising the ARNG Range Safety Program and to:
a. Identify the resources necessary to effect policy and standards throughout the ARNG in accordance with (IAW) AR 385-63.
b. Coordinate with other HQDA staff agencies and the Adjutants General on matters pertaining to the ARNG Range Safety Program.

1-6. Chief, Safety and Occupational Health Branch (NGB-AVS-S)
The Chief, NGB-AVS-S shall- -
a. Develop, implement, and manage the ARNG Range Safety Program.
b. Review the design of all ranges to be constructed or remodeled for compliance with safety and occupational health standards and make recommendations to appropriate approval authority.
c. Determine the classification of indoor firing ranges based upon input from the state safety manager, the ventilation measurements, and the air monitoring results (breathing zone and general area).

d. Conduct an initial evaluation of new IFRs and reevaluate every two years thereafter. An IFR will be reevaluated if modifications to the range structure or ventilation system are made. *Approval from the State Safety Office and Regional Industrial Hygienist must be obtained before the range is returned to service.*

f. Determine and publish the training requirements for the persons who will conduct range evaluations.

1-7. Chief, Training Division (NGB-ART)
The Chief, NGB-ART shall provide weapons training strategies consistent with AR 350-41 and the Standard and Training Commission.

1-8. Chief, Installations Division (NGB-ARI)
The Chief, NGB-ARI shall- -

a. Provide the design standards for the construction of indoor firing ranges.

b. Ensure that the designs for new and remodeled indoor firing ranges meet approved standards and are reviewed and approved by the Safety and Occupational Health Branch.

1-9. The State Adjutant General
The State Adjutant General shall- -

a. Establish, supervise, and direct a safety and occupational health program for users of indoor firing ranges.

b. Ensure all ranges being used are classified as "safe" or "limited use", those ranges classified as "limited use" under the criteria of this regulation are used on a limited basis, and all ranges classified as "unsafe" under the criteria of this regulation are not used.

c. Determine and identify funding requirements to ensure development of a comprehensive safety and occupational health program for the users of indoor firing ranges.

1-10. State Safety Manager
State Safety Managers shall—

a. Perform or coordinate performance of all inspections and evaluations of indoor firing ranges.

b. Determine whether the range is "safe" or "unsafe" based on the physical safety inspection.

c. Review and approve all indoor firing range SOPs to ensure all requirements are met. An example SOP can be found at Figure 1-3 of this regulation.

d. Perform design review of IFRs to ensure current safety and occupational health related compliance requirements are met.

e. Make recommendations to the Adjutant General regarding the disposition of "unsafe" and "limited use" ranges.

f. Approve the use of the range by non-military organizations.

g. Maintain copies of all range inspections, ventilation measurements and visitors log.

1-11. State Occupational Health Nurse
The Occupational Health Nurse shall- -

a. Schedule medical surveillance examinations for individuals who are or may be exposed to Lead above the action level for more than 30 days per year.

b. Maintain exposure monitoring (air sampling results) and medical surveillance records for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C, Section I.

c. Record the worker's exposure data on DA Form 4700 (Medical Record-Supplemental Medical Data) overprints, IAW TB MED 503 paragraph 3-2 f (1)(a), and DODI 6055.5-M Occupational Health Surveillance Manual.

d. Institute a training program that identifies the hazards and preventive measures for all personnel with a potential for exposure to Lead.

1-12. State Environmental Office
The State Environmental Office shall coordinate disposal of all hazardous waste generated from range operation, cleaning, and maintenance.

1-13. Facility Commanders
Commanders of facilities with indoor firing ranges shall maintain and be familiar with AR 385-63, and the provisions of this regulation, to ensure that- -

a. A Safety and Occupational Health Compliance Program is developed as specified in this regulation.
b. Indoor firing ranges are secured when not in use.
c. A custodian is appointed for all indoor firing ranges under his/her area of command.
d. The custodians of the indoor firing ranges maintain the visitors log and follow procedures IAW paragraph 1-14 of this regulation.
e. All non-military organizations using indoor firing ranges under their area of command have signed a contract/agreement delineating the conditions of range use and liability. The contract/agreement should also include provisions for hazardous waste disposal expenses.
f. A SOP for each range is established, enforced and approved by the State Safety and Occupational Health Office.
g. All required signs are posted IAW Section 1-22 of this regulation.
h. All individuals using indoor firing ranges under the facility commander's area of command have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and that these individuals have signed an agreement to follow the rules stated therein. See paragraph 1-29 for record maintenance requirements.
i. Range custodians are enrolled in respiratory protection and medical surveillance programs as required by paragraph 1-37 of this regulation (if applicable).
j. Range custodians have documentation to show that they have been educated about the health effects of exposure to Lead dust IAW 29 CFR 1910.1200 and 29 CFR 1910.1025. This is an annual requirement IAW this standard.
k. No equipment or furniture, such as tables, chairs or storage cabinets, is stored or maintained in the range.
l. All range safety officers and maintenance personnel have a copy of this regulation, AR 385-63, and the range SOP and are familiar with and in compliance with all indoor firing range policies and procedures.
m. The range ventilation system is checked every 480 hours of operation IAW paragraph 1-27 of this regulation.
n. Personnel do not fire ammunition in excess of the allowable time as dictated by established exposure limits. (See Figure 1-1).
o. Exposure records shall be maintained IAW paragraph 1-34 when personnel are exposed to airborne Lead concentrations in excess of 0.03 milligrams per cubic meter (mg/m^3).
p. Lead fragments are not removed from the bullet trap or surrounding areas except as coordinated through the State Environmental Office.
q. The use of M16 rifles using 5.56 mm ammunition in the indoor firing range is *prohibited*, except on ranges where the bullet trap is rated for 5.56 mm ammunition. Otherwise, the M16 shall be used with .22 caliber adapter and ammunition.
r. The ventilation system is in operation at all times during firing or cleaning.

1-14. Range Custodians
Custodians shall- -

a. Ensure that all individuals using the indoor firing range understand the range safety regulations, rules, and SOP.
b. Ensure that all cleaning procedures are performed IAW the requirements of this regulation and the procedures prescribed in the Addendum. This includes documentation of dates, names of personnel and time on the range for all cleaning procedures. See paragraph 1-29 for record maintenance requirements.

c. Maintain the visitor log IAW the range SOP. As a minimum the log should include the names of the shooters, the amount of time spent in the range by each individual, the date of firing, the type(s) of ammunition fired, and the number of rounds fired. See paragraph 1-29 for record maintenance requirements.

d. Forward a copy of the visitor log to the State Safety and Occupational Health Managers on a quarterly basis

1-15. Unit Commanders

Unit Commanders shall- -

a. Enforce all range safety and occupational health procedures.

b. Maintain a record of time spent on the range for all personnel using **"limited use"** firing ranges as recorded by the range custodian.

c. Provide the State Occupational Health Nurse with a list of personnel firing in ranges classified as **"limited use"** ranges for more than the prescribed times listed in Figure 1-1. See paragraph 1-29 for record maintenance requirements.

d. Designate range safety officers in writing.

e. Provide the State Occupational Health Nurse with a list of range safety officers and custodians.

f. Ensure all range safety officers and range custodians are enrolled in the Medical Surveillance and Respiratory Protection Programs, as required.

1-16. Procedures, classification and use

Indoor firing ranges have been built in armories for many years. Each range design reflects the current emphasis and technology on protecting the health and safety of the shooter. Older ranges may not meet the current standards deemed necessary to accomplish this. However, under controlled conditions, many older ranges will not expose users to hazardous conditions.

1-17. Classification of ranges

Based on inspection data collected on the range inspection checklist (Figure 1-2), ranges shall be classified as **"safe"**, **"limited use"** or **"unsafe"**. **Safe** ranges permit authorized firing for military and civilian use. **Limited use** ranges permit use only under controlled conditions based on the personnel exposure limits for intermittent Lead exposure. (Figure 1-1). **Unsafe** ranges are not authorized for use under any conditions.

a. **Building envelope.** (Design standards may be found in OG 415-1, Appendix A or CEHNO 1110-1-18).

(1) **Safe ranges.**

(a) Each firing lane is at least 4 feet wide.

(b) Pipes, conduits, lights, lighting fixtures and other projecting surfaces are baffled or covered by a material that will protect these items and prevent ricochets.

(c) Baffles do not disrupt the uniform airflow in the range.

(d) In older ranges, sidewall windows in front of the firing line have been removed and the openings sealed flush to the wall with materials compatible with the adjacent walls. New ranges are not built with windows in front of the firing line.

(2) **Unsafe ranges.**

(a) All firing lanes are less than 4 feet wide. If any one firing lane is less than 4 feet wide, that lane shall not be used for firing.

(b) Pipes, conduits or walls are not sealed to prevent migration of Lead dust to other areas of the range. (See the Addendum for wipe sample procedures used to determine if Lead dust is leaking from the range).

(c) There are open floor drains in the range.

(d) Carpet is located in any part of the range. (Contact the State Environmental Offices for hazardous waste disposal procedures.)

(e) Doors or windows located downrange of the firing line.

(f) Range buildings do not meet the other requirements of safe ranges as prescribed in the checklist in Figure 1-2 of this document.

b. **Ventilation**

(1) **Safe ranges.**

(a) The range has an operational mechanical ventilation system.

(b) The average airflow at the firing line in each firing lane is at least 50 feet per minute (fpm).

(c) Air is exhausted at or behind the bullet trap.

(d) Supplied air is introduced into the range behind the shooters.

(e) The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system.

(f) The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas.

(g) Air is not recirculated in the firing range unless equipped with monitoring equipment as specified in section 1-26 of this regulation.

(h) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is at least -. 05 inches of water gauge (wg) but does not exceed -.20 wg.

(i) A smoke test of the range shows laminar airflow in the range and no turbulence at the firing line. (See the Addendum, for troubleshooting guidance)

(j) In passive make-up air systems, the supply air louvers and exhaust fan shall be electrically interlocked.

(k) In systems with active make-up air, the supply and exhaust fans shall be electrically interlocked. The make-up air fan should start after the exhaust fan to ensure the range maintains a negative pressure.

(l) Range air temperature should be between 65 degrees and 80 degrees Fahrenheit.

(2) **Unsafe ranges.**

(a) The airflow at the firing line on any lane is less than 50 fpm at any level and air sampling results suggest possible overexposure as determined by a competent person.

(b) The range has no mechanical ventilation.

(c) The ventilation system is constructed in a manner that allows exhaust air to enter into other parts of the building or another building air supply system.

(d) The make-up air exceeds the exhaust, which forms a positive air pressure in the range in relation to adjoining areas.

(e) Air is exhausted anywhere other than at the bullet trap.

(f) Make-up air is supplied only from adjacent areas of the building with no provision for inclusion of outside air.

(g) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is measured less than -. 05 wg or in excess of -. 2 wg.

(h) The range is under positive pressure.

(i) The supply and exhaust air systems are not electrically interlocked.

c. **Range lighting.**

(1) **Safe ranges.**

(a) Lighting is uniform, non-glaring and does not cause shadows.

(b) Illumination is at least 100 foot candles on the targets and 30 foot- candles in all other areas.

(c) All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range.

(d) Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line.

(e) Emergency lights are provided behind the firing line and are in working condition.

(f) Exit lights are provided as required.

(g) Lighting of at least 30-foot candles is provided behind the bullet trap for maintenance.

(2) **Unsafe ranges.**

(a) Illumination is below 100 foot-candles on targets or 30 foot-candles in other areas.

(b) Portions of the lighting fixtures are not protected by baffles.

(c) Electrical hazard exists in the range.

d. **Bullet traps.**

(1) **Safe ranges.**

(a) A bullet trap is permanently installed in the range.

(b) Bullet traps are of a commercial design that complies with the requirements of CEHND 1110-1-18, DG 415-1 App. A, and this regulation.

(c) The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. See CEHND 1110-1-18, for thickness requirements for the bullet trap.

(d) All plate/sand trap type bullet traps shall be designed to prevent ricochets by directing the projectiles in the same direction they are traveling.

(e) Sandpits in plate/sand trap type backstops shall extend to a point directly below the leading edge of the sloped plate.

(f) Forward edges in a escalator or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets.

(2) **Unsafe ranges.**

(a) Steel bullet traps are bowed, punctured or severely pitted.

(b) Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth.

(c) Any type of portable bullet stop is used.

(d) Forward edges in a escalator or venetian blind type bullet trap are maintained in less than a knife edge condition

e. **Targets and target carriers.**

(1) **Safe ranges.**

(a) A target retrieval system is operable in all lanes and is constructed in such a manner as to minimize flat surfaces exposed to the firing line. (Firing lanes without a target retrieval system shall not be used).

(b) Only paper targets are used.

(2) **Unsafe ranges.** Target retrieval system is inoperable or not installed in the entire range, or target retrieval system exposes flat surfaces to the firing line.

f. **Lead levels.**

(1) **Safe ranges.**

(a) For personnel exposed less than 30 days per year, Lead levels do not exceed 0.05 mg/m^3.

(b) For personnel exposed more than 30 days per year and for all non-Department of Defense (DoD) personnel, Lead levels do not exceed 0.03 mg/m^3.

(c) For personnel under the age of 18, see Figure 1-1.

(2) **Limited use ranges.**

(a) For personnel exposed less than 30 days per year, Lead levels exceed 0.05 mg/m^3 but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample. Personnel exposures shall be controlled by limiting the shooters to the times described in Figure 1-1.

(b) For personnel exposed more than 30 days per year and for all non-DoD personnel, Lead levels exceed 0.03 mg/m^3 but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample.

(3) **Unsafe ranges.**

Lead levels in air sample results exceed 0.4 mg/m^3 in any breathing zone or general area sample.

1-18. Range use

a. Indoor firing ranges shall not be used for any purpose other than firing. (I.e., they shall not be used for classrooms, exercise rooms, storage, etc.).

b. Ranges classified as unsafe may be used for other purposes only after proper decontamination IAW the guidance provided in the Addendum, Guidelines and Procedures for IFR Rehabilitation, Conversion, and Cleaning.

c. The ventilation system is in operation at all times during firing or cleaning.

d. Equipment or furniture shall not be stored or maintained in the range, plenum area or behind the bullet trap. (For removal of equipment or furniture, use cleaning instructions provided in the Addendum).

e. A hand-held ABC-type fire extinguisher is located near the entrance door, inside the firing range.

1-19. Prohibitions

a. Personnel shall *not* be permitted in the plenum area during firing even if designed for observation.

b. Plenum area and area behind the bullet trap shall *not* be used for storage of any equipment.

c. An area directly in front of the plenum wall shall be kept clear at all times to preclude obstruction of airflow.

d. Variable speed fans are *not* permitted.

e. Dry sweeping of indoors firing ranges is *prohibited*. Brooms shall not be stored in the range.

f. Walking downrange is *prohibited* for individuals other than maintenance and inspection personnel.

g. Pellets, BBs, magnum and armor piercing rounds are *prohibited* in all indoor firing ranges.

h. To prevent contamination with Lead dust, clothing or equipment that is not required for firing shall *not* be permitted into the range.

i. Storage of ammunition and explosives in indoor firing ranges is *prohibited*, except in approved and licensed facilities.

j. There are no open floor drains in the range.

k. Carpet will not be located in any part of the range (Contact the State Environmental Office for hazardous waste disposal procedures).

1-20. Personal protective equipment

a. **Eye protection**. All personnel in an indoor firing range during firing shall wear eye protection that meets the requirements of ANSI Z87.1-1999, Practice for Occupational and Educational Eye and Face Protection.

b. **Hearing protection.** All personnel in an indoor firing range during firing shall wear Army approved hearing protection listed in DA Pam 40-501. When noise levels exceed 165 dBP, personnel must wear earplugs in combination with noise mufflers.

c. **Respiratory protection.** For respiratory protection requirements during indoor firing range conversion cleanup operations, see the Addendum.

1-21. Posting warning signs

a. The following signs shall be posted in or in the vicinity of indoor firing ranges IAW AR 385-63:

(1) Eating, Drinking and Smoking are *prohibited*

(2) Dry Sweeping is *prohibited*

(3) Wash Hands and Face Immediately Following Firing

(4) Only the Following Ammunition is *authorized* for use on this Range: _____

(5) Hearing Protection *shall be* properly worn during firing

(6) Proper Safety Glasses/Goggles *shall be* worn during firing

(7) Furniture or storage of other items of equipment is *not* permitted in the range

b. The following signs shall be posted on the entrance door to the range:

(1) Noise Hazardous Area

(2) Danger Lead Hazard Area

(3) Pregnant women are *not* permitted in this area.

c. An illuminated warning sign, which is interlocked with the range ventilation switch, shall be located outside of the firing range to alert individuals that the range is in use.

d. Each firing lane shall be numbered at the firing line and at the bullet trap visible to all shooters. This is to ensure shooters use the correct target.

e. A warning sign *shall be* posted outside of the access door to the bullet trap, which warns personnel not to enter during range operation.

Note: All signs shall meet the requirements of DA Pam 385-64.

1-22. Range Standing Operating Procedures.

a. Each indoor firing range shall have a written SOP, which is approved by the State Safety and Occupational Health Office, see figure 1-3.

b. Range SOPs shall include, as a minimum, the following:

(1) The requirement for establishment and maintenance of a log of visitors for the indoor firing range. The log shall include the following information for all visitors:

(a) Name and age of shooter.

(b) Organizations (if civilian, include address and phone number).

(c) Sign-in and sign-out times and date.

(d) Type of ammunition used and number of rounds fired.

(2) The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

(3) Work practices including permissible and banned practices as specified by this regulation.

(4) Instructive guidance for all range procedures.

(5) Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

(6) Authorized ammunition for the range.

(7) The requirement for posting of signs IAW section 1-21 of this regulation.

(8) Cleaning and maintenance requirements.

(9) Personal protective equipment requirements for maintenance, firing and cleaning.

c. Refer to TG 206 for more general guidance on SOPs.

1-23. Inspection requirements.

The first part of each inspection shall be the physical safety inspection conducted by the State Safety Manager. Once the firing range has passed this portion of the inspection, a competent person shall complete the ventilation survey and air sampling requirements.

1-24. Initial inspections

a. An initial inspection of all new and renovated indoor firing ranges shall be completed before the facility is accepted. The inspection report shall be kept on file with the State Safety and Occupational Health Office. The checklist in Figure 1-2 shall be used for this purpose. See paragraph 1-29 for record maintenance requirements.

b. Findings on the initial firing range inspection, ventilation measurements, and air sampling results shall determine the range classification.

1-25. Annual Inspections

a. A safety inspection of each active range shall be made annually to ensure safety standards, procedures and records are maintained in the operation of the range. These inspections shall be completed by State Safety personnel IAW AR 385-10. The checklist in Figure 1-2 shall be used for this purpose.

b. In accordance with AR 385-63, the annual inspection shall be performed within 45 days of the anniversary date of the initial inspection or the last annual inspection.

c. Verify that ventilation measurements have been recorded ever 480 hours of operation.

d. Ensure that air sampling has been conducted after changes or additions have been made to the range.

1-26. Ventilation requirements

a. Procedures for evaluating supply and exhaust ventilation systems, firing line velocities and static pressure readings are identified in the Addendum.

b. If air from the indoor firing range exhaust ventilation system is recirculated into the supply system of the range, the system shall have a high efficiency particulate air (HEPA) filter with reliable back-up filter. In addition, controls to monitor the concentration of Lead and Carbon Monoxide in the return air *shall be* installed and programmed to bypass the recirculation system automatically if the filter system fails. This system shall be operating and maintained IAW 29 CFR 1910.1025(e)(4)(ii).

1-27. Air sampling requirements

a. Initial air sampling to determine airborne Lead dust levels during prescribed firing procedures shall be conducted for all IFRs prior to routine use. If initial determination reveals employee exposure to be at or above .003 ug/m^3, sampling shall be repeated IAW 29 CFR 1910.1025(d)(6)(ii).

b. Air sampling shall be accomplished for each type of ammunition to be used in the range. (For air sampling procedures, see the Addendum).

c. After the initial air sampling, air sampling is required only if changes or additions have been made to the range, there are changes in ammunition or weapons used in the range, or if changes have occurred in ventilation measurements. Once changes occur, air sampling shall be completed every two-years and prior to range use.

d. ARNG Regional Industrial Hygienists are responsible for air sampling of indoor firing ranges to determine airborne Lead concentrations. A competent person as designated by a Regional Industrial Hygienist may conduct the air sampling.

e. The State Occupational Health Nurse shall maintain copies of all air sampling results when required as part of personnel exposure records. See paragraph 1-11 for specific requirements.

1-28. Inspection reports

A completed inspection report shall be provided to the state Adjutant General for information or action as appropriate. An information copy shall also be provided to the Commander of the facility and to the state safety manager. A complete inspection report shall consist of the completed safety inspection checklist, ventilation data, and air sample results (initial inspection and as required by paragraph 1-24 above). Subsequent inspections shall be made as a follow-up check against results of previous inspections to assure required corrective actions have been accomplished, and there are no adverse changes to the buildings' integrity, safety equipment, environment or safe operating procedures.

1-29. Record maintenance

a. All exposure monitoring and medical surveillance records shall be maintained for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C.

b. The State Safety Manager shall maintain a record of all inspections for each indoor firing range in the state. All inspections after the initial one shall be used as follow-up checks against previous inspection reports. This is to ensure that required corrective actions have been accomplished and that there have been no structural changes to the building, environmental conditions or safe operating procedures. These records shall be checked during program evaluations and industrial hygiene surveys.

1-30. Control of potential Lead intoxication

Occupational Safety and Health Administration (OSHA) Lead standard

a. The requirements of the OSHA Lead standard (29 CFR 1910.1025) shall be followed. The requirements include development of a written compliance program for the protection of workers from Lead exposures (29 CFR 1910.1025(e)(3)). The program shall include at a minimum the following:

(1) A description of each operation where Lead is emitted;
(2) Methods used to achieve compliance;
(3) Methods used to meet the permissible exposure level;
(4) Air monitoring data, which documents the source of air emissions;
(5) A detailed schedule for implementation of the program;
(6) Work practices including PPE (Personal Protective Clothing and Equipment), housekeeping, hygiene facilities and practices;
(7) Administrative control schedule;
(8) Personnel enrollment in medical surveillance;
(9) Other relevant information.

b. Refer to TG 206 for specific guidance on developing the compliance program.

1-31. Alternative ammunition

a. Reduced-Lead and Lead-free ammunition (non-Lead containing bullets) has become commercially available. These alternatives to conventional ammunition should be considered for training use if command policy allows.

b. Lead-free ammunition is being developed which shall have the same ballistic properties as the Lead counterparts. The potential exists for some Lead containing ammunition to be completely replaced by Lead-free ammunition for training and operational uses.

c. Until Lead-free ammunition is available, Lead exposure can be significantly reduced by the use of jacketed rounds. Most bullet traps are rated for the use of jacketed ammunition, but this should be verified with the bullet trap manufacturer.

1-32. Maintenance requirements

a. The following are minimum maintenance requirements, which shall be performed every three months by the range custodian or by a person designated by the facility commander:

(1) Inspect the ventilation system fan for condition of belts to ensure that the belts are not torn or frayed and that they are not slipping.

(2) Evaluate static pressure and compare to the baseline static pressure reading. Any changes shall be reported to the State Safety and Occupational Health Office for further evaluation.

(3) Inspect louvers, if applicable, to ensure they are opening fully.

(4) Lubricate the bullet trap (if applicable).

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

b. See the Addendum for a complete list of maintenance requirements for the bullet trap.

1-33. Housekeeping

a. The ventilation system shall be in operation during all cleanup operations.

b. An approved National Institute for Occupational Safety and Health (NIOSH) respirator (P-100) for Lead exposure *shall be* used during cleanup operations.

c. During range cleaning operations, workers shall wear coveralls or similar full-body clothing, gloves, hat and change of shoes or disposable booties, face shields and goggles, or other equipment to protect the workers skin and eyes.

d. Blowing, shaking or any other means, which disperses Lead into the air, *shall not* be used to remove Lead dust accumulated on worker's clothing or equipment. A designated area shall be used for changing clothes to prohibit the spread of contamination. Workers shall shower and change clothes before release from work.

e. Wet cleaning methods or vacuum cleaning with HEPA filtration shall be utilized during normal cleaning operations. Dry sweeping, dusting, wiping or blowing with compressed air *shall not* be permitted.

f. The range shall be cleaned at the end of each firing day with a HEPA vacuum or wet mop method.

g. When performing the cleaning, clean the floor and all horizontal surfaces fifteen feet in front of and behind the firing line, or when there is a visible accumulation of lead dust.

h. Wash water contaminated with Lead can be collected and allowed to slowly evaporate leaving Lead deposits/sludge that may be collected in plastic containers, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums *shall be* properly labeled to identify contents. Disposal of containerized waste *shall be* coordinated IAW state hazardous waste program requirements.

i. The State Environmental Office shall coordinate removal and disposal of all containerized hazardous waste derived from routine use, cleaning, and maintenance of IFRs. Contact your State Environmental Office for proper disposal instructions when bullet trap catch trays are ¾ full. Spent cartridge cases shall be collected and processed in accordance with local ammunition inventory and accountability procedures, AR 710-2, and DA PAM 710-2-1.

j. Prior to converting an indoor firing range to other uses, the entire range area shall be properly decontaminated of any Lead residue. For cleaning and decontamination instructions, see the Addendum.

1-34. Maximum exposure hours
Personnel exposure limits for intermittent atmospheric Lead contamination has been developed by the U.S. Army Medical Command (MEDCOM) in the form of a table of Lead exposure limits (Figure 1-1). This table was developed to control intermittent Lead exposure and to establish maximum allowable hours of exposure based on the airborne Lead concentration and the number of days firing per year. Intermittent exposures to Lead in indoor firing ranges shall be controlled according to the criteria provided in the table of Lead exposure limits as an interim control measure only. Maximum effort *shall be* made to introduce permanent control measures to reduce the airborne Lead levels to 0.03 mg/m^3 or less. Exposure records shall be maintained by the commander of the facility on all personnel who use the firing range when the airborne Lead levels exceed $0.03\ mg/m^3$. These records shall contain the airborne Lead concentrations and the amount of time spent on the range for each individual. Other potential Lead exposure, including off duty firing, may contribute to an individuals overall exposure and should be considered in establishing maximum allowable exposure time.

1-35. Extent of use
a. The extent of use for any indoor firing range *shall be* based on permissible exposure of all using personnel to concentrations of airborne Lead dust.
b. Under no circumstances shall pregnant women be permitted in an indoor firing range, IAW 29 CFR 1910.1025, Appendix C, Section II (5).
c. Personnel under 17 years of age are *prohibited* from entering any range area with a Lead concentration greater than 0.100 mg/m^3. For ranges with Lead concentrations less than 0.100 mg/m^3, follow the guidelines in Figure 1-1.
d. Use of the indoor firing range by non-military organizations shall be approved and documented in writing by the State Safety Manager.

1-36. Medical surveillance
a. Personnel who are or may be exposed to Lead above the action level (0.03 mg/m^3) for more than 30 days per year shall be enrolled in the Medical Surveillance Program.
b. Medical surveillance is not required for intermittent users of indoor firing ranges if the maximum allowable exposure hours shown in Figure 1-1 is not exceeded.

1-37. Terms
a. **Backsplatter**-This refers to the small particles, which break off of a bullet as it impacts the bullet trap. Variables such as the bullet composition, angle of the bullet trap, and the velocity of the impact dictate the amount and pattern of the backsplatter. A ricochet occurs when the main body of the bullet is deflected off the surface of the bullet trap.
b. **Competent person**-An individual who has been specifically trained to identify safety and occupational health hazards associated with Lead dust and indoor firing ranges. The individual is aware of current regulations governing indoor firing ranges and of ventilation principles and terminology, air sampling media and collection requirements and can interpret air sample results. He can provide appropriate guidance in the abatement of known hazards and has the authority to do so. He can correctly use diagnostic ventilation evaluation equipment and interpret results. He has received written authorization from the regional industrial hygiene office to properly evaluate indoor firing ranges.
c. **Plenum**-This term refers to a chamber used to build static pressure before the air enters the firing range. Air is introduced into the plenum from the side, top, or back and is forced through a perforated wall (called the plenum wall) behind the firing line.
d. **Smoke Testing**-To conduct a smoke test, a smoke candle is ignited behind the firing line. The smoke is used to check the airflow at and in front of the firing line. There should be laminar flow down the range to the bullet trap and no turbulence at the firing line. It is also important to ensure the smoke does not circle back behind the firing line.

FIGURE 1-1

0.000 - 0.029	8	8	4
0.030 - 0.039	8	6	3
0.040 - 0.049	8	4.5	2
	LIMITED USE RANGES	LIMITED USE RANGES	LIMITED USE RANGES
0.050 - 0.059	6	4	2
0.060 - 0.079	5	3	1
0.080 - 0.099	4	2.25	1
0.100 - 0.149	2.5	1.5	0
0.150 - 0.199	2	1	0
0.200 - 0.299	1.25	0.75	0
0.300 - 0.399	1	0.5	0
0.400 – 0.499	0.75	0.5	0
0.500 – 0.749	0.5	0.25	0
0.750 – 0.999	0.25	0.25	0
1.000 or above	0	0	0

- **These values are the actual concentrations measured over the sampling period and are not 8-hour time-weighted averages.**
- **Adherence to these guidelines shall prevent overexposure to Lead in indoor firing ranges.**

* Recommend that an Occupational Health Physician make the determination on length of firing time for individuals 17 years of age and younger.

FIGURE 1-2

INDOOR FIRING RANGE INSPECTION CHECKLIST

See paragraphs 1-23 through 1-25 of this regulation for inspection requirements. For the range to be considered safe each of the following statements shall be true and air-sampling results shall be below the standard for Lead. The information in parentheses after each statement denotes the location of the requirement in this or other regulations.

Location of the Range _____ Date _____

Range Custodian _____ Telephone _____

Part 1, Physical Safety Inspection

A. Building Envelope

_____ 1. Each firing lane is at least 4 feet wide. [1-17a(1)(a)]

_____ 2. Pipes, conduits, and other projecting surfaces are baffled or covered by a material that shall protect these items and prevent ricochets. [1-17a(1)(b)]

_____ 3. No windows or doors are located in front of the firing line. (Except access door to the back of the bullet trap) [1-17a(1)(d)]

_____ 4. There are no open floor drains in the range. [1-17a(2)(c)]

_____ 5. There is no carpet, drapes or other fiber-like material in the range. [1-17a(2)(d)]

_____ 6. Pipes, conduits and walls are sealed to prevent leakage of Lead dust from the range into other areas. [1-17a(2)(b)]

_____ 7. The interior surfaces or the range floor, walls, and ceiling have no protruding edges or devices. [DG 415-1, App.A, 3-1d]

_____ 8. The roof provides ballistic security. [DG 415-1, App. A, 3-1e(1)]

_____ 9. The walls provide ballistic security. (DG 415-1, App. A, 3-1f(1))

_____ 10. Interior mortar joints are flush with the interior surface. (DG 415-1, App. A, 3-1f(2))

_____ 11. The plenum wall is adequately supported and thick enough to avoid flexing. (DG 415-1, App. A, 3-1f(4))

_____ 12. The entrance door to the range is weather-stripped unless the door acts as passive make-up air intake. (DG 415-1, App. A, 3-1h)

B. Range Lighting

_____ 1. Lighting is uniform, non-glaring and does not cause shadows. [1-17c(1)(a)]

_____ 2. Illumination is at least 100 foot candles on the targets and 30 foot candles in all other areas. [1-17c(1)(b)]

_____ 3. All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range. [1-17c(1)(c)]

_____ 4. Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line. [1-17c(1)(d)]

_____ 5. Emergency lights are provided behind the firing line and are in working condition. [1-17c(1)(e)]

_____ 6. Exit lights are provided and working as required. [1-17c(1)(f)]

_____ 7. Lighting of at least 30 foot-candles is provided behind the bullet trap for maintenance (if applicable). [1-17c(1)(g)]

_____ 8. No known electrical hazards exist in the range. [1-17c(2)(c)]

C. Bullet traps

_____ 1. A bullet trap is permanently installed in the range. [1-17d(1)(a)]

_____ 2. Bullet traps are of a commercial design, which is in compliance with the requirements of CEHND 1110-1-18, NGB-ARI, the Addendum, and this regulation. [1-17d(1)(b)]

_____ 3. The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. [1-17d(1)(c)]

_____ 4. All plate/sand trap type bullet traps are designed to prevent ricochets by directing the projectiles in the same direction they are traveling. [1-17d(1)(d)]

_____ 5. Sandpits in plate/sand trap type backstops extend to a point directly below the leading edge of the sloped plate. [1-17d(1)(e)]

_____ 6. Forward edges in a louver or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets. [1-17d(1)(f)]

_____ 7. Steel bullet traps are not bowed, punctured or severely pitted. [1-17d(2)(a)]

_____ 8. Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth. [1-17d(2)(b)]

D. Targets and target carriers

_____ 1. A target retrieval system is operable in all lanes. [1-17e(1)(a)]
(Any one firing lane without a retrieval system shall not be used for firing)

_____ 2. The target retrieval system is constructed in such a manner as to minimize flat surfaces exposed to the firing line. [1-17e(1)(a)]

_____ 3. Only paper targets are used in the range. [1-17e(1)(b)]

E. Range use

_____ 1. The range is not used for any purpose other than firing. [1-18a]

_____ 2. No equipment or furniture is stored or maintained in the range, plenum area or behind the bullet trap. [1-17d]

_____ 3. No additional clothing or equipment is brought into the range. [1-19h]

_____ 4. Personnel are *not* permitted in the plenum area during firing even if designed for observation. [1-18a]

_____ 5. Individuals other than maintenance and inspection personnel are not allowed to walk downrange. (Except in regularly cleaned area as needed to pick up brass) [1-19f]

_____ 6. All areas directly in front of the plenum walls are kept clear at all times. [1-19c]

_____ 7. Pellets, BBs, magnum and armor piercing rounds are not used in the range. [1-19g]

_____ 8. The ventilation system is in operation at all times during firing or cleaning. [1-18c]

_____ 9. A hand-held ABC-type fire extinguisher is located in a recessed cabinet near the entrance door, inside of the firing range. [DG 415-1, App. A, 4-5]

F. Range maintenance

_____ 1. Dry sweeping does not occur in the range. [1-19e]

_____ 2. No brooms are located in the range. [1-19e]

_____ 3. A range custodian is appointed for the range who is fully trained and aware of his/her responsibilities. [1-13c]

G. Personnel protective equipment

_____ 1. All personnel in the range during firing wear ANSI approved eye protection. [1-20a]

_____ 2. All personnel in the range during firing wear ANSI approved hearing protection. [1-20b]

H. Posting of signs

_____ 1. The following signs are posted in or in the vicinity of the range: [1-21a]
- _____ a. Eating, Drinking and Smoking are *Prohibited*
- _____ b. Dry Sweeping is *Prohibited*
- _____ c. Wash Hands and Face Immediately Following Firing
- _____ d. The Following Ammunition is authorized for use on this Range: _____
- _____ e. Hearing Protection *shall be* Properly worn during firing
- _____ f. Proper Safety Glasses/Goggles *shall be* worn during firing
- _____ g. No Furniture or Storage of Items Permitted in the Range

_____ 2. The following signs are posted on the entrance door to the range: [1-21b]
- _____ a. Noise Hazardous Area
- _____ b. Danger Lead Hazard Area
- _____ c. Pregnant women are *not* permitted in this Area

_____ 3. An illuminated warning sign, which is interlocked with the range ventilation switch, is located outside of the firing range to alert individuals that the range is in use. [1-21c]

_____ 4. Each firing lane is numbered at the firing line and at the bullet trap visible to all shooters. [1-21c]

_____ 5. A warning sign is posted outside of the access door to the bullet trap, which warns personnel not to enter. [1-21e]

I. Range SOP

_____ 1. The indoor firing range has a written SOP, which is approved by the State Safety and Occupational Health Office. [1-10e]

_____ 2. The range SOP includes as a minimum the following: [1-22b]

_____ a. The requirement for establishment and maintenance of a log of visitors for the indoor firing range.

_____ b. The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

_____ c. Work practices including required, recommended, permissible and banned practices as specified by this regulation.

_____ d. Instructive guidance for all range procedures.

_____ e. Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

_____ f. Authorized ammunition for the range.

_____ g. The requirement for posting of signs IAW section 1-21 of this regulation.

_____ h. Cleaning and maintenance requirements.

_____ i. Personal protective equipment requirements for maintenance, firing and cleaning.

J. Recordkeeping

_____ 1. A visitors log is maintained which includes the following information for all visitors/shooters: [1-14c]

_____ a. Name and age of shooter.

_____ b. Organization (if civilian, include address and phone number).

_____ c. Sign in and sign out times.

_____ d. Type of ammunition used and number of rounds fired.

_____ 2. Copies of initial and other previous inspections are available. [1-24a]

_____ 3. The initial inspection report includes air-sampling data. [1-24b]

_____ 4. An OSHA compliance program is in place, which covers the required aspects. [1-30a]

_____ 5. All individuals using the indoor firing range have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and have signed an agreement to follow the rules stated therein. [1-13h]

_____ 6. State maintenance officers/custodians have documentation to show that they have been educated to the health effects from exposure to Lead dust. [29 CFR 1910.1200 and 29 CFR 1910.1025]

_____ 7. Range safety officer(s) is/are designated. [1-13c]

K. New and Renovated Ranges

_____ 1. No doors are installed in the plenum wall.

_____ 2. Plenum area is at least 4 feet deep.

_____ 3. An access door is installed behind the bullet trap.

_____ 4. Only escalator or rubber bullet traps are installed.

INDOOR FIRING RANGE INSPECTION CHECKLIST

Part 2. Ventilation Inspection

A. Existing Ranges

_____ 1. The range has an operational mechanical ventilation system. [1-17b(1)(a)]

_____ 2. The minimum ventilation rate at the firing line in each firing lane is 50 fpm at all levels. [1-17b(1)(b)]

_____ 3. 100% of air is exhausted at or behind the bullet trap. [1-17b(1)(c)]

_____ 4. Make-up air is introduced into the range behind the shooters. [1-17b(1)(d)]

_____ 5. Air that is introduced through vents into the plenum does not exceed a velocity of 600 fpm. [1-17b(1)(e)]

_____ 6. Air exiting through holes in the plenum wall has a velocity between 400 and 600 fpm. [1-17b(1)(f)]

_____ 7. The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system. [1-17b(1)(g)]

_____ 8. The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas. [1-17b(1)(h)]

_____ 9. If air is recirculated in the range, it is installed with a HEPA filter with a reliable back-up filter. [29 CFR 1910.1025(e)(4)(ii)]

_____ 10. If air is recirculated in the range, controls to monitor the concentration of Lead and Carbon Monoxide levels are installed and programmed to bypass the recirculation system automatically if the filter system fails.
[29 CFR 1910.1025(e)(4)(ii)]

_____ 11. The fan(s) in the ventilation system is a single speed fan only. [DG 415-1, App. A, 3-2a]

_____ 12. A smoke test of the range shows laminar air flow and no turbulence in the range. (See the Addendum for troubleshooting guidance) [1-18b(1)(k)]

_____ 13. In non-powered systems, the supply air louvers and exhaust fan are electrically interlocked. [1-17b(1)(l)]

_____ 14. In power systems, the supply and exhaust fans are electrically interlocked. The make-up air fan should start slightly after the exhaust fan. [1-17b(1)(m)]

_____ 15. Range air temperature is between 65 degrees and 80 degrees Fahrenheit. [1-17b(1)(n)]

B. New and Renovated Ranges

_____ 1. A manometer is installed leading into the exhaust fan, which is capable of measuring at least 20 inches of static pressure.

_____ 2. Supply and exhaust fans are electrically interlocked with the downrange lighting.

_____ 3. The face velocity on supplied make-up and exhaust ducts does not exceed 2000 cfm per square foot of duct space.

_____ 4. Passive supply systems have opposing blade louvers.

_____ 5. Turning vanes are installed in all duct elbows, which have between 60° and 90° angles.

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

INDOOR FIRING RANGE INSPECTION CHECKLIST

Part 3, Air Sampling

1. The physical safety inspection, Part 1 of the range inspection checklist, was completed and all requirements met on: _____

2. The ventilation inspection, Part 2 of the range inspection checklist, was completed and all requirements met on: _____

3. Air sampling has been scheduled for: _____

Print and sign: _____

Position: _____ Date: _____

4. Air sampling was completed on: _____ for the following types of ammunition: _____

5. Air sample results do not exceed: _____ mg/m^3 (results are attached)

6. For military personnel exposed less than 30 days per year, this range is classified as: _____ (SAFE, LIMITED USE, UNSAFE)

7. For military personnel exposed more than 30 days per year and for all non-DoD personnel, this range is classified as: _____ (SAFE, LIMITED USE, UNSAFE)

Print and sign: _____

Position: _____ Date: _____

FIGURE 1-3
EXAMPLE OF INDOOR FIRING RANGE SOP
STATE OF _____, DEPARTMENT OF MILITARY AFFAIRS
XXXX SOUTH MAIN STREET
SOMEWHERE, _____ XXXXX-XXXXX
_____ ARMORY INDOOR FIRING RANGE
STANDING OPERATING PROCEDURE (SOP)

1. **References:**

a. AR 385-10
b. AR 385-63
c. NGR 385-10
d. NG PAM 385-XX
e. 29 CFR 1910.1025
f. 29 CFR 1920.1200
g. 29 CFR 1926
h. 29 CFR 1960
i. USACHPPM, TG 141

2. **Purpose.** The _____ Armory indoor firing range SOP is published to establish procedures to minimize the exposure of Lead (Pb) to personnel and provide uniform safe range operations and maintenance procedures. The provisions set forth herein shall govern all actions and personnel associated with range operations.

3. **Review and Update.** This SOP should be reviewed yearly by the Commander of the facility and the State Safety and Occupational Health Office. A cover sheet, which documents the signature and dates of personnel involved with the review of the SOP, should be attached.

4. **General.**

a. Each Officer or Non-Commissioned Officer In-Charge (OIC/NCOIC) of range operations shall maintain a current copy, and be familiar with the provisions of this SOP, and NGR 385-10.

b. These directive and military regulations are applicable to all active duty military, military technicians, federal and state civilian employees and civilian personnel, to include local or state police authorities.

5. **Range Control.**

a. The _____ Armory Commander shall appoint, in writing, a Commissioned Officer, Warrant Officer, or a Senior NCO to the position of Range Control Officer (RCO).

b. The RCO is responsible to perform the following:

(1) Enforce the facility range safety program and SOP.

(2) Notify Armory personnel of times when the range shall be in use.

(3) Coordinate and schedule all activity on the firing range.

(4) Ensure that the range is secured when not in use.

(5) Ensure that nothing is stored at the range.

(6) Investigate and report all accidents and incidents involving weapons and ammunition in accordance with NGR 385-10.

(7) Determine which weapons and ammunition are authorized for the range. This should be coordinated through the Safe Safety and Occupational Health Office and in accordance with manufacturers' specifications.

(8) Ensure that all OIC/NCIOCs are thoroughly familiar with the weapons in use, and that the appropriate operators' manuals for the weapons are on hand.

(9) Prepare a range OIC/NCOIC briefing packet for all using units. The packet should contain, as a minimum; a copy of this SOP, emergency telephone numbers of local rescue authorities, and a current copy of the Accident Prevention Plan (**Appendix C** of this SOP).

(10) Ensure that mandatory signs listed in NGR 385-10, paragraph 1-21 are posted as required.

6. Range OIC/NCIOC. The Commander or supervisor of all using units or groups shall designate an OIC/NCOIC in the grade of E-6 or above to be the responsible for the safe conduct of firing and proper use of the facilities. The commander/supervisor shall ensure that all appointed individuals are qualified to perform their assigned duties. The duties of the range OIC/NCOIC shall include but are not limited to the following:

a. Prior to firing.

(1) Receive a thorough briefing from the RCO, and conduct an inspection of the range with the RCO, or his/her designated representative. If the condition of the range is acceptable, assume control and request clearance from the RCO to fire.

(2) Ensure the overall safe conduct of training and the proper use of the facility.

(3) Ensure that all participants are familiar with the verbal commands, hand signals, range procedures and safety requirements.

(4) Be present when the range is in use and determine when it is safe to fire.

(5) Be knowledgeable of the weapons to be used and ensure that only authorized weapons and ammunition are used. Ensure that the proper operators' manuals are available for each individual using the range.

(6) Be familiar with the Accident Prevention Plan and have a current copy on hand prior to commencement of firing.

(7) Ensure that at least three individuals are present on the range when the range is in use.

(8) Ensure that all personnel wear the proper hearing and eye protection as required.

(9) Ensure that all individuals using the range have singed-in on the roster maintained by the facility Commander.

(10) Ensure that the range has a working telephone, or that other means of emergency communication is available.

(11) Ensure that appropriate emergency medical personnel have been notified that the range is in use, and that the projected hours of operation are from __ .__ _ to __ . _ hours.

b. During Firing.

(1) Ensure that personnel do not leave the firing line without the permission of the OIC/NCOIC.

(2) Ensure that the muzzle of each weapon is pointed downrange at all times. Personnel may holster their handguns after being cleared by the OIC/NCOIC to do so.

(3) When not in use, revolvers shall have cylinders open and automatic weapons shall have magazines removed and the slide/receiver locked to the rear. Rifles shall also have the magazine removed, if applicable, bolts and/or slides open or locked to the rear when not in use. Weapons shall be carried to and from the firing line in the configuration described above, with the muzzle pointed downrange.

(4) Ensure that weapons malfunctions/jams are cleared only at the direction of the OIC/NCOIC in accordance with the procedures established in the operators' manual for the weapon.

(5) Ensure that weapons are cleared and checked during temporary suspension of firing.

(6) Ensure that firing is stopped promptly when an unsafe act is observed or reported.

(7) Do not permit persons to walk in front of the firing line during firing. Lanes with inoperable target retrieval systems shall not be used.

(8) Limit firing time, if applicable. This limitation shall be based on air-sampling results for individuals using the range and ventilation measurements. Contact the State Safety Manager to determine if the range has time limitations placed upon it.

c. After Firing.

(1) Ensure that all weapons are cleared prior to being removed from the firing line.

(2) Ensure that all individuals on the range thoroughly wash their hands and face immediately after leaving the range.

(3) Ensure that all bullet casings are removed from in front of and behind the firing line and that the range is restored to a serviceable condition. **Dry sweeping of the range is prohibited.**

(4) Conduct a final inspection of the range. Secure the range, and turn the keys and shooters log into the RCO or his/her designated representative.

7. **Range Control Officer Qualifications.** His or her commander may appoint any individual in the rank of E-5 and above to the Rang Control Officer. Appointment orders for all RCOs shall be maintained on-file at the facility. Commanders of each facility shall ensure that all RCOs have been properly instructed and are competent in performance of their duties. Law enforcement and civilians requesting appointment to perform RCO duties, shall show evidence that they have completed an Army and/or National Rifle Association approved firearms instructor's course or equivalent prior to appointment.

8. **Range Restrictions.**

a. The _____ Armory is restricted to firing the following ammunition based upon manufacturer specifications:

EXAMPLE

(1) .22 caliber including the M-16 with adapter
(2) .38 caliber
(3) .45 caliber
(4) 9 mm pistols

Note: No other weapons can be fired without the approval of the State Safety Manager.

b. Pellets, BBs, magnum and armor piercing rounds are prohibited.

c. Dry sweeping of the range is prohibited.

d. Trick shooting including, quick draw and hip shooting is prohibited.

e. Storage of any item in the range is prohibited.

f. Smoking and consumption of food or beverages is prohibited.

g. Proper hearing and eye protection shall be worn during firing.

h. Civic groups with individuals under 18 years of age are required to have written permission from the ARNG State Safety Manager prior to firing.

i. Personnel shall not be allowed in the observation/plenum area during firing.

9. **Mandatory Signs.** As a minimum the following signs shall be posted on the door/entrance to the range or inside as appropriate:

a. Inside the Range.

(1) Eating, drinking and/or smoking are prohibited.

(2) Dry sweeping is prohibited.

(3) Wash hands and face immediately after firing.

(4) Hearing protection shall be worn during firing.

(5) Safety glasses/goggles shall be worn during firing.

(6) Storage of furniture and other items is prohibited.

(7) The following ammunition is authorized for this range: _____, _____, _____, and _____.

b. On the Door to the Range.

(1) Noise Hazardous Area.

(2) Danger Lead Hazard Area.

(3) Pregnant women are not permitted in this area.

10. **Authorized Use of the Range.** Utilization of the _____ Armory range is authorized for organizations of the _____ Army National Guard conducting unit training and for the marksmanship team conducting competition or in preparation for competition. Non-Military personnel are subject to the same requirements and regulations as National Guard personnel and shall be in strict compliance with this SOP, Army Regulations, ARNG regulations and applicable subject letters and directives from the Adjutant General, State of _____.

11. **Release of Liability.**

a. The military Range Control Officer shall obtain a signed Release of Liability (**Appendix D of this SOP**) form from each civilian user of the range. Signed agreements shall be kept on file with the Commander of the facility.

b. Organizations with members who are minors shall obtain Permission and Release of Liability (**Appendix D** of this SOP) form signed by a parent or guardian. **The ARNG State Safety Manager shall be notified prior to minors firing on ARNG ranges.**

12. **Denial of Range Access.** The Commander of the facility may withdraw range privileges from any person or organization that willfully disobeys rules and regulations pertaining to range operations. In addition, range privileges may be denied to an individual whose knowledge of the principles of marksmanship is deficient to the degree of posing a safety hazard.

FOR THE COMMANDER:

John Doe
CPT, IN, ___ARNG
OIC/Armory Commander

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
ABBREVIATIONS

ANSI
American National Standards Institute

AR
Army Regulation

ARNG
Army National Guard

CFM
Cubic feet per minute

CFR
Code of Federal Regulations

CNGB
Chief, National Guard Bureau

DA
Department of the Army

FPM
Feet Per Minute

HEPA
High Efficiency Particulate Air

IAW
In Accordance With

IFR
Indoor Firing Range

mg/m^3
Milligrams per cubic meter

NIOSH
National Institute for Occupational Safety and Health

NGB
National Guard Bureau

OSHA
Occupational Safety and Health Administration

SOP
Standing Operating Procedure

SP
Static pressure

USACHPPM
U.S. Army Center for Health Promotion and Preventive Medicine

wg
Inches of water gauge

APPENDIX B
REFERENCES

ACGIH 22nd Ed, Industrial Ventilation
A Manual of Recommended Practice

Army Regulation (AR) 11-34
The Army Respiratory Protection Program

AR 40-5
Preventive Medicine

AR 350-41
Army Forces Training

AR 385-63
Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat

AR 385-64
U.S. Army Explosives Safety Program

Army National Guard (ARNG) Design Guide (DG) 415-1
Design Guide for Armories

American National Standards Institute (ANSI) Z87.1-1989
Practice for Occupational and Educational Eye and Face Protection

CEHND 1110-1-18
USACE (U.S. Army Corp of Engineers) Design Manual for Indoor Firing Range

Department of the Army Pamphlet (DA PAM) 385-64
U.S. Army Explosives Safety Program

DA PAM 40-501
Hearing Conservation

DA PAM 710-2-1
Using Unit Supply System (Manual Procedures)

Department of Defense Instruction (DODI) 6055.1
Department of Defense Occupational Safety and Health (OSH) Program

DHEW NIOSH 76-138
Lead Exposure and Design Considerations for Indoor Firing Ranges

FM 25-7
Training Ranges

National Guard Regulation (NGR) 385-10
Army National Guard Safety and Occupational Health Program

NGR 415-5
Military Construction Army National Guard (MCARNG) Project Development

APPENDIX B (Continued)

GR 420-10
Operations/Maintenance and Minor Construction, Army National Guard

Technical Bulletin Medical (TB MED) 502
Occupational and Environmental Health, Respiratory Protection Program

TB MED 506
Occupational and Environmental Health, Occupational Vision

TG 206
USACHPPM Technical Guide for Indoor Firing Ranges

Title 29, Code of Federal Regulations (CFR) Revision, Part 1910
Occupational Safety and health Standards

APPENDIX C
INDOOR FIRING RANGE ACCIDENT RESPONSE PLAN

1. If a mishap or injury occurs at any time during the conduct of range operations, the following procedures shall be followed:

a. The OIC/NCOIC or person in charge of the range shall order a cease-fire immediately. All weapons shall be cleared and muzzles pointed downrange.

b. Render first aid to the injured as appropriate.

c. The OIC/NCOIC or person in charge of the range shall direct an individual to telephone and/or radio for medical assistance. The primary telephone to be used in case of an emergency is located _____. The emergency numbers are _____.

d. A person shall be stationed at the main entrance of the range to provide direction to emergency medical personnel.

e. After all injured personnel have been removed or attended to:

(1) The OIC/NCOIC shall notify the RCO of the mishap.

(2) The RCO shall in-turn notify the office of the Adjutant General at DSN _____, or the duty officer, and the State Safety and Occupational Health Office at DSN _____.

f. The RCO, with the assistance of the State Safety Manager, shall investigate the mishap and file a DA Form 285 "Accident Investigation" as appropriate.

2. All injuries or mishaps shall be reported to the RCO as soon as possible. The OIC/NCOIC shall be responsible to obtain witness statements and assist in making reports as may be required.

APPENDIX D
PERMISSION AND RELEASE OF LIABILITY CERTIFICATE

_____ ARNG
Somewhere, USA
Date: _____

BE IT KNOWN TO ALL: WHEREBY I, _____;
Have been granted permission to use firearms on the indoor firing range located at the _____ Army National Guard Armory; and whereas I am doing so entirely upon my own initiative, risk, and responsibility; now therefore, in consideration of the permission extended to me by the United States Government and/or State of ____ through their officers and agents do hereby for myself, heirs, executors and administrators, remiss, release and forever discharge the Government of the United States and the State of ____, the ____ Army National Guard, their officers, agents, employees expressly including the Adjutant General of the State of ____, acting officially or otherwise, from any and all claims, demands, action, or causes of action on account of my death, or account of injury to me or my property which may occur from any cause during the period of the above granted permission. I further acknowledge and certify by my signature below that I have read and understand the applicable range facility standing operating procedure (SOP) and shall comply with it and all applicable safety regulations.

Signature: _____

Witness to Signature: _____

In case of emergency, please contact:

Name _____
Address _____
_____
Telephone Number _____

TO BE SIGNED BY THE PARENT OR GUARDIAN OF INDIVIDUALS UNDER 18 YEARS OF AGE. NO MINOR SHALL BE ALLOWED TO UTILIZE AN ARNG FIRING RANGE WITHOUT PARENT OR GUARDIAN SIGNATURE.

I, said parent, and/or legal guardian of the above-named minor, hereby give my consent to said minor executing this release, and do hereby also release and agree to save harmless the parties above-named as to said minor and as to myself as an individual, and for our heirs, executors, administrators and assigns.

Signature of Parent or Guardian: _____

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).

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.

(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.

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.

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.

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.

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.

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 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 800-247-6828 800-359-3041	2-3388M

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	2-3381M

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APPENDIX E (Continued)

800-247-8628
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

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

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:

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.								B
Pump No.								L
Time On								A
Time Off								N
Total Time (min)								K
Flow Rate (LPM)								
Volume (liters)								
GA/GE								
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:

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

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.

BEST AVAILABLE COPY

Industrial Hygiene Survey

Massachusetts Army National Guard (MA ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Bridgewater Readiness Center

576 Bedford Street
Bridgewater, MA 02324-3197

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

Survey Date: August 18, 2010
Report Date: September 23, 2010

AEI Project #: J10-515 3d MA Bridgewater RC

_____

Non-Responsive

Industrial Hygienist

Table of Contents

List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Readiness Center located at 576 Bedford Street, Bridgewater, MA, 02324-3197. Non-Responsive performed the evaluation on August 18, 2010. The point of contact for the facility was Sergeant First Class 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: 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) evaluations of operations including operation description, 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:

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.

Lead in Air Samples: Lead in air samples to determine if any airborne contamination of lead existed in the facility were not collected at the Bridgewater Readiness Center due to sample pump malfunction.

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 areas of peeling or flaking paint were observed. Three wipe samples collected from the former firing range that has not been converted and that is being used for storage were above the National Guard criteria for lead contamination (200 µg/ft^2). Samples ranged from 1.2 to 10 times the National Guard criteria. Lead was identified in samples collected from the overhead heater vent, on top of the light fixture, and the old ductwork remaining in the area. Additionally, the wipe sample taken from the stairway immediately outside the former firing range was above National Guard criteria.

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. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. A damaged suspect asbestos-containing gasket on an overhead was observed in the old firing range. The gasket was inaccessible due to standing water located in the space under the heater.

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. Standing water is located in the old firing range which is located in the basement of the facility. National Guard personnel indicated water may be the result of flooding through the exterior door of the boiler room located adjacent.

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: The evaluation indicated that there are some illumination deficiencies in the Administrator's Office. The illumination measurements indoors ranged from a low of 13.5 foot candles (fc) to a high of 141.4 fc.

Indoor Air Quality: Temperatures and relative humidity measurements were outside the acceptable range in some areas of the facility. These results are not unexpected due to outdoor conditions on the day of the survey and the lack of air conditioning in most of the facility. Indoor levels of CO_2 ranged from 383 to 1,034 parts per million (ppm) and outdoor CO_2 levels were approximately 390 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange. Indoor levels of CO ranged from 0 to 0.4 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Massachusetts Army National Guard (MA ARNG) Readiness Center located at 576 Bedford Street, Bridgewater, MA, 02324-3197. Non-Responsive performed the evaluation on August 18, 2010. The point of contact for the facility was Sergeant First Class 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 Bridgewater Readiness Center is staffed with 3 administrative 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 Bridgewater 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 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 Bridgewater facility consists exclusively of supply and administrative duties. No maintenance of vehicles, painting of equipment or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer 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

Heat is supplied to the facility through a boiler located in the boiler room and overhead heaters in the drill hall. The boiler certificate for the Bridgewater facility is expired and is not up to date. Any air conditioning provided to the building is through window air conditioning units. No local ventilation systems were present at 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 water damage or mold problems; potential ergonomic problems; and housekeeping practices. Lighting and indoor air quality measurements were taken in all areas of the facility as well.

Lead in Air Samples

Lead in air samples to determine if any airborne contamination of lead existed in the facility were not collected at the Bridgewater Readiness Center due to sample pump malfunction.

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 areas of peeling or flaking paint were 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 10cm x 10cm templates. Wipe samples for surface dust were collected in 15 locations. The Environmental Protection Agency (EPA) and the Commonwealth of Massachusetts 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 Center for Health Promotion and Preventive Medicine (USACHPPM) 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 Aerosol Monitoring and Analysis Analytical Services, Inc. (AMA) for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Three wipe samples collected from the former firing range were above the National Guard criteria for lead contamination (200 µg/ft^2). Samples ranged from 1.2 to 10 times the National Guard criteria. Lead was identified in samples collected from the overhead heater vent, on top of the light fixture, and the old ductwork remaining in the area. Additionally, the wipe sample taken from the stairway immediately outside the former firing range was above National Guard criteria. The history of the indoor firing range was not known to current employees at the Readiness Center. It appeared not to have been converted in accordance with NG PAM 420-15 and it was being used for storage. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for MA ARNG Bridgewater Readiness Center on August 18, 2010.

Wipe Sample #	Sample Location	Result (µg/ft²)*
BRI-PB-01	Room 3, Radiator Supply Vent	<110
BRI-PB-02	Drill Hall, Top of Flammable Cabinet	<110
BRI-PB-03	Drill Hall, Top of Lockers	<110
BRI-PB-04	Kitchen, From Serving Bar	<110
BRI-PB-05	Drill Hall, Middle of Floor	<110
BRI-PB-06	Old Firing Range, From Old Ductwork	**240**
BRI-PB-07	Old Firing Range, Overhead Heater	**710**
BRI-PB-08	Old Firing Range, Light Fixture	**2,000**
BRI-PB-09	Old Firing Range, Stored Pelican Case	<110
BRI-PB-10	Old Firing Range, Floor by Door	<110
BRI-PB-11	Stairway, Immediately Outside Door to Firing Range	**470**
BRI-PB-12	Room 8, From Desktop	<110
BRI-PB-13	Room 12, From Mess Table	<110
BRI-PB-14	Room 14, From Supply Shelf	<110
BRI-PB-15	Room 7, From Top of File Cabinet/Bookshelf	<110

*The US Army CHPPM recommends a maximum level for adult exposures of 200 µg/ft² lead on floors

Visual Inspection for Damaged Suspect Asbestos-Containing Materials

A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. A damaged suspect asbestos-containing gasket on an overhead was observed in the old firing range. The gasket was inaccessible due to standing water located in the space under the heater.

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. Standing water is located in the old firing range which is located in the basement of the facility. National Guard personnel indicated water may be the result of flooding through the exterior door of the boiler room located adjacent.

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

Illumination levels were measured using a Cal-Light 400L, calibrated on July 30, 2010, 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 that there are some illumination deficiencies in the Administrator's Office. The illumination measurements indoors ranged from a low of 13.5 foot candles (fc) to a high of 141.4 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination. Additional illumination can be achieved by replacing burned-out lamps, cleaning fixtures, relocating detailed work to more illuminated areas, using supplemental task lighting, and opening doors or windows to provide more natural lighting.

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 2010. 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 55-2004. 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 G 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 55-2004

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 70.9 to 79.7° F and 43.8 to 74.0% Rh. Outdoor temperature and humidity measurements were 80.0° F and 62.0% on the day of monitoring. Temperatures and relative humidity measurements were outside the acceptable range in some areas of the facility. These results are not unexpected due to outdoor conditions on the day of the survey and the lack of air conditioning in most of the facility.

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 – 2007 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 383 to 1,034 parts per million (ppm) and outdoor CO_2 levels were approximately 390 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange.

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 62.1-2007 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 to 0.4 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

7 Conclusions
The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, peeling potentially lead-based paints, noise hazards, indoor air quality, visible mold, the presence of damaged suspect asbestos-containing materials and housekeeping. The results of the evaluation indicated industrial hygiene concerns in the following areas: cross contamination from the former firing range, water intrusion and lighting. Overall, Bridgewater Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees.

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.

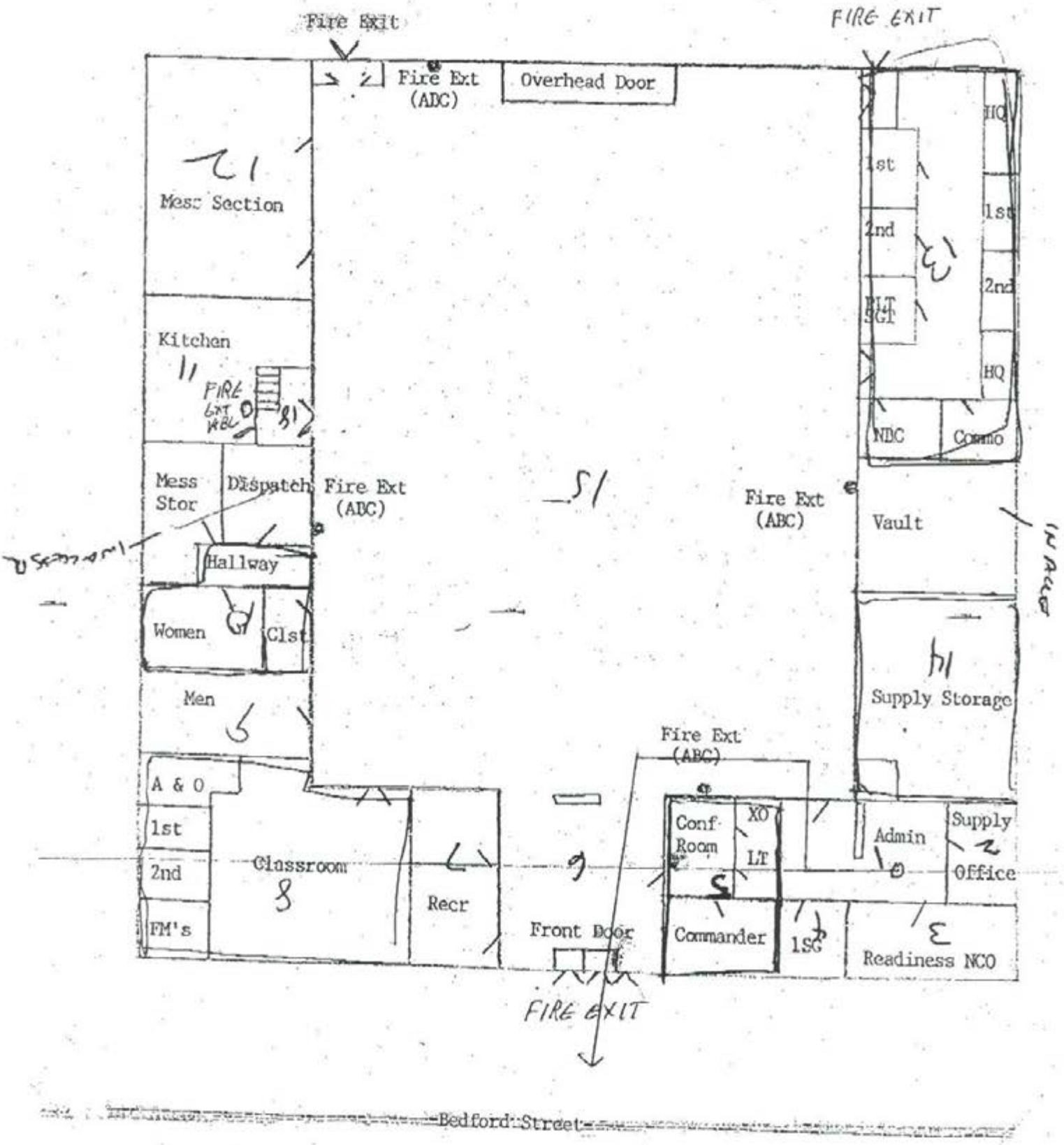
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential 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, August 23, 2007.
6. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 15, 1998.
7. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
8. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
9. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
10. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
11. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2007, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2004, "Thermal Environmental Conditions for Human Occupancy".
12. NIOSH website: http://www.cdc.gov/niosh/
13. OSHA website: http://www.osha.gov/.
14. Army CHPPM website: http://chppm-www.apgea.army.mil/.
15. EPA website: http://www.epa.gov.

Appendix A
Building Layout

Co C Fire Exit Plan and Fire Extinguisher Plan



Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Bridgewater Readiness Center	**Chain Of Custody:**	508589
Address:	301-lH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Bridgewater, MA	**Date Submitted:**	8/19/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-0003	**Date Analyzed:**	8/26/2010 **Report Date:** 8/26/2010

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
1071885	BRI-PB-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071886	BRI-PB-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071887	BRI-PB-03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071888	BRI-PB-04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071889	BRI-PB-05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071890	BRI-PB-06	Flame	Wipe	****	0.108	110	ug/ft²	26	240	ug/ft²	
1071891	BRI-PB-07	Flame	Wipe	****	0.108	110	ug/ft²	76	710	ug/ft²	
1071892	BRI-PB-08	Flame	Wipe	****	0.108	110	ug/ft²	210	2000	ug/ft²	
1071893	BRI-PB-09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071894	BRI-PB-10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071895	BRI-PB-11	Flame	Wipe	****	0.108	110	ug/ft²	50	470	ug/ft²	
1071896	BRI-PB-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071897	BRI-PB-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071898	BRI-PB-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1071899	BRI-PB-15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

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
LAP #100470

NY ELAP 10920

Client:	National Guard Bureau	**Job Name:**	Bridgewater Readiness Center	**Chain Of Custody:**	508589		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Bridgewater, MA	**Date Submitted:**	8/19/2010		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-0003	**Date Analyzed:**	8/26/2010	**Report Date:**	8/26/2010

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)-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) 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 sampes.
NY ELAP accreditation applies only to paint chip, wipe, and soil samples.

Analyst: Non-Responsive

Technical Manager: Non-Responsive

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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) **508589**

p. 1/2

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: BRIDGEWATER READINESS CENTER
2. Job Location: BRIDGEWATER MA
3. Job #: [redacted]
4. Contact Pers[redacted]
5. Submitted by[redacted]

Reporting Information (Results will be provided[redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: ____ ☐ 24 Hours Time Due: ____ Comments: ____	☐ Immediate ☐ 3 Day ☐ Next Day ☒ 5 Day + ☐ 2 Day Date Due: 8/26/10 ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Incl[redacted]ith Report ☒ Ema[redacted] ARIAENVIRO.COM ☐ Fax:[redacted]us.army.mil ☐ Verb[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 GHOST) 15 (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 / ANALYSIS / MATRIX

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
BR1-PB-01		8/18/10		10x10 cm				X				X					Date/Time: Contact: By:
BR1-PB-02																	
BR1-PB-03																	
BR1-PB-04																	
BR1-PB-05																	Date/Time: Contact: By:
BR1-PB-06																	
BR1-PB-07																	
BR1-PB-08																	
BR1-PB-09																	Date/Time: Contact: By:
BR1-PB-10																	
BR1-PB-11																	
BR1-PB-12																	

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 8 / 19 / 10 @ 1020 Via: FedEx By (Pri[redacted]
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ Date: ____ / ____ / ____ Initials: ____
4. Comments: ____

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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 508589 p 2/2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
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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: SAME
2. Job Location:
3. Job #: P.O. #: W912K6-09-A-0003
4. Contact Perso [redacted] Non-Responsive
5. Submitted by:

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 +
❑ 2 Day Date Due:
❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ Email: [redacted] Non-Responsive
❑ Fax:
❑ Verbal:

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 ℃)

Metals Analysis
❑ Pb Paint Chip (QTY)
❑ Pb Dust Wipe (wipe type) (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	CLIENT CONTACT (LABORATORY STAFF ONLY)
BR1-PB-13		8/18/10		8x10				X				X					Date/Time: Contact: By:
BR1-PB-14		↓		↓				↓				↓					
BR1-PB-15								↓				↓					
																	Date/Time: Contact: By:
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print):
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Comments Reported To: Via: Date: / / Time: Initials:
4. Comments:

Non-Responsive

Appendix C
Photo Documentation

Bridgewater RC

Drill Hall

Front Entry

Kitchen

Storage Area, Former Firing Range

Bridgewater RC

Remnants of Water Leak

Damaged Air Handler

Boiler Room

Storage Area

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	**Bridgewater**	IAQ							Light		
Date	8/18/2010	Inspector	Non-Responsive	Instrument		TSI Q-Trak Plus Model 8554					Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		8554-02041015					Serial Number		K070277
Weather Conditions				Last Calibration		Mar-10					Last Calibration		30-Jul-10
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Value (fc)
1	Administrator	4		72.1		48.0		936		0.4		47.1	X	50
2	Office			72.1		47.6		1048		0.3		123.8		50
3	Office			72.5		48.3		1034		0.3		115.2		50
4	Office			70.9		43.8		1023		0.3		144.4		50
5	Computer Room			74.3	X	72.5	X	476		0.0		30.8		30-50
6	Entry			75.0		69.7		424		0.0		84.0		10
7	Office			75.6		69.6		416		0.0		63.1		50
8	Office			75.4		63.4		428		0.1		79.7		50
9	Men's Room			75.2		63.6		425		0.1		97.4		5
10	Women's Room			75.7		61.7		404		0.0		92.4		5
11	Kitchen			76.3		66.5		399		0.1		98.5		50
12	Mess Hall			76.6		64.6		383		0.1		80.7		10
13	Supply Room			76.6		65.8		761		0.1		22.2		10
14	Supply Office			78.1	X	64.9	X	506		0.3		81.6		50
15	Drill Hall			79.7	X	62.6	X	481		0.1		49.5		30
16	Firing Range/ Storage			77.2		65.8		417		0.3		13.5		10
17	Boiler Room			73.6	X	74.0	X	765		0.2		40.5		30
18	Stair Well			73.8	X	73.3	X	488		0.0		17.4		5

Notes:

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°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

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
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
576 BEDFORD STREET
BRIDGEWATER, MA 02324

July 11, 2013
PN: 39743799

Non-Responsive
Director, Industrial Hygiene Services

Non-Responsive
Project Manager

TABLE OF CONTENTS

Section **Page**

APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
576 BEDFORD ST., BRIDGEWATER, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in several locations tested.	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, arm rests and keyboards. Wheeled chairs with 4 casters were noted.	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
Water Intrusion		
Water staining and suspect microbial growth was observed in 220th QM Team office.	The source of the water intrusion should be identified and repaired. The water-stained materials should be repaired or replaced (ACGIH – Guidelines for the Assessment of Bio-aerosols in the Indoor Environment).	RAC 3
Lead		
Six of the 10 lead wipe samples indicated elevated lead levels. Peeling paint could be contributing to the elevated lead in dust levels on building surfaces.	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
Emergency Exits		
Emergency exit signs and escape plans were not visible from all areas of the facility or illuminated.	Emergency exits should be properly illuminated (29 CFR 1910.37 (q)(6)).	RAC 3
Exits		
An exit along the east perimeter was blocked.	Exits shall be so arranged and maintained as to provide free and obstructed egress (29 CFR 1910.36 (b)(4)).	RAC 3

Findings	Recommendations	Risk Assessment Code (RAC)
Asbestos		
Asbestos-containing pipe insulation and presumed asbestos-containing floor tiles and associated mastic were observed throughout the facility; an Asbestos Operation and Maintenance Program was not available onsite.	Develop a site-specific asbestos operations and maintenance program for management of asbestos-containing materials in place as required by OSHA 29 CFR 1910.1001(j)(2).	RAC 4
Personal Protective Equipment		
Hazard assessments have not been conducted to determine whether personal protective equipment is 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 4
Fire Extinguishers		
No evidence was found that all fire extinguishers were being inspected on a monthly basis.	All fire extinguishers must be inspected on a monthly basis to determine that they are full and readily accessible (OSHA 29 CFR 1910.157(e)(2)).	RAC 3
Ladder Storage		
Ladders were observed not secured and properly stored.	Ladders not in use must be properly stored in a vertical position fastened to walls (29 CFR 1910.25 (c)(2)(i)).	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 Readiness Center in Bridgewater, Massachusetts.

URS representative, Ms. Non-Responsive, conducted the Industrial Hygiene Survey on April 9, 2013. 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 mapping.

The Bridgewater Readiness Center is a one-story brick building, consisting of offices, classrooms, a supply area, a classroom/mess hall, gender separate bathrooms, storage rooms, a kitchen, an Assembly Hall and a former Indoor Firing Range. A layout of the Readiness Center is provided in Appendix A.

GENERAL: The basement former Indoor Firing Range was posted as unsafe due to lead contamination. Illuminated emergency exit signs were not observed throughout the facility. Emergency escape plans were not posted throughout the facility. Moderate water staining and suspect microbial growth was observed in 220th QM Team offices. Evidence of water intrusion was observed along the bottom of the door to the former Indoor Firing Range. Ladders were not properly secured and stored. One of the exits along the east perimeter was blocked at the time of the survey. Bookshelves in the Day Room south of the lobby were overloaded.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in several of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress work areas must be lighted by at least the minimum light intensities.

LEAD: Six of the ten wipe samples collected in the Readiness Center were found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

On the day of the survey, none of the paint chip samples was found to contain a level of lead above the HUD criteria for determination of paint as lead-based.

ASBESTOS: Asbestos-containing pipe insulation was identified during this survey, however no Asbestos Operations and Maintenance Program was found on site.

Presumed asbestos-containing floor tiles and associated mastic were identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. 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, keyboards, and monitors were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker.

Several wheeled chairs were observed with only four casters.

NOISE: Noise mapping in the Readiness Center determined that noise levels were below the OSHA permissible exposure limit (PEL) and Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and conducting administrative functions. The building includes offices, classrooms, a supply area, a classroom/mess hall, gender separate bathrooms, storage rooms, a kitchen, an Assembly Hall and a former Indoor Firing Range.

The Readiness Center was found to be neat and organized at the time of URS' site visit.

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 Readiness Center. Interior carbon dioxide concentrations were found to be between 410 and 439 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (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 but is typically 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 404 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below 1,104 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 Readiness Center was measured between 0.0 ppm and 0.6 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-Trak 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.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 46.1%, which was within the guideline of less than 65% recommended by ASHRAE.

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.

The average temperature inside the Readiness Center was, 71.6 °F, which was within the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Readiness Center 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 in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
Supply Room, front counter	Storage	43.0	30
Supply Room, shelves	Storage	32.5	30
Admin, front desk	Admin	**32.5**	50
Training/ Supply Sgt., desk- Non-Responsive	Admin	61.1	50
Commander Office, desk- Non-Responsive	Admin	121.6	50
Paving Section Sgt., desk	Admin	79.1	50
Day Room off lobby, workstation	Admin	**42.4**	50
220th QM Team, desk- Non-Responsive	Admin	68.5	50
220th QM Team, workstation	Admin	**40.5**	50
Classroom/ Mess Hall, table	Break Room	87.8	50
Classroom/ Mess Hall, table	Break Room	95.5	50
Corridor to basement	Hall	**1.5**	5

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in three of the locations surveyed.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center 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 Readiness Center

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Foot ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Foot ($\mu g/ft^2$)
Classroom/ Mess Hall, window sill, rear corner	Bridgewater RC Wipe-01	0.108	**320**	200

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Foot ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Foot ($\mu g/ft^2$)
Day Room, NCR/ projector cart, shelf	Bridgewater RC Wipe-02	0.108	160	200
Latrine, Men's, floor behind door from Drill Hall	Bridgewater RC Wipe-03	0.108	150	200
220th QM Team, floor by windows, under copier	Bridgewater RC Wipe-04	0.108	<110	200
Commander Office, window sill at center	Bridgewater RC Wipe-05	0.108	**240**	200
Basement, former Indoor Firing Range, floor at door	Bridgewater RC Wipe-06	0.108	**530**	200
Basement, former Indoor Firing Range, stairwell landing to 1st floor	Bridgewater RC Wipe-07	0.108	**630**	200
Drill Hall, floor between rolling door and classroom, under pallets	Bridgewater RC Wipe-08	0.108	<110	200
Storage Units, Commo Unit, floor at storage shelves	Bridgewater RC Wipe-09	0.108	**7,400**	200
Supply Room, floor behind side exit door	Bridgewater RC Wipe-10	0.108	**300**	200

Six of the ten surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

Two paint chip samples were collected from areas of peeling paint within the facility and were analyzed for lead content. The analytical report from AMA is contained in Appendix C.

According to the U.S. Department of Housing and Urban Development (HUD), paint is considered to be lead-based if the quantity of lead is greater than 0.5% by weight.

OSHA has not established a minimum percentage of lead to be defined as lead-based paint, therefore paint with lead in any amount above the analytical detection limit is considered to be lead-based under these regulations. The results of URS' lead paint testing are contained in Table 2-3.

Table 2-3
Lead Content in Painted Surfaces

Paint Location	Lead Concentration (Percent Weight)	HUD Lead-Based Quantity (Percent Weight)
Gray paint, floor, stairwell from basement	0.24	0.5
Gray paint, floor, 220th QM Team	0.015	0.5

On the day of the survey, neither of the paint chip samples was found to have a lead content above the HUD criteria for determination of paint as lead-based. However, lead from the peeling paint may be contributing to elevated lead dust levels on building surfaces.

2.2.7 Asbestos

URS collected a total of three samples from damaged suspect friable asbestos-containing material (ACM) 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 with dispersion staining (EPA-600/M4-82-020). Table 2-4 below shows the results of the asbestos sampling.

Table 2-4
Asbestos Bulk Sample Results – Basement

Sample Location	Sample Description	URS Sample Number	Result Total Asbestos
Classroom/ Mess Hall, rear corner towards Drill Hall	Pipe Insulation	Bridgewater RC PLM-01A- 01C	40% Chrysotile

The EPA states that any material with an asbestos content greater than 1% must be treated as ACM (EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA is contained in Appendix C.

Presumed asbestos-containing floor tiles and associated mastic were also identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

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, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Noise mapping was conducted throughout the Readiness Center. Area noise mapping results indicated that, on the day of the survey, noise levels throughout the Readiness Center ranged from 56.1 decibels to 62.8 decibels. All noise mapping results were below the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 decibels, A scale (dBA)/8-hour day.

2.5 Personal Protective Equipment

Personal protective equipment was orderly and readily available to employees in the Readiness Center. Personal protective equipment included hard hats, safety glasses, ear plugs and nitrile gloves. At the time of URS' site visit, personal protective equipment was not observed in use.

3.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

3.1 Confined Spaces

A written confined spaces program was identified but is not required for this site.

3.2 Hearing Conservation

A written hearing conservation program was identified on site. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise mapping results, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was not identified on site. No operations were observed by URS that would require the use of respiratory protection.

3.4 Hazard Communication

A site-specific hazard communication program was identified on site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A written personal protective equipment program was identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site.

3.7 Safety

The basement former Indoor Firing Range was posted as unsafe due to lead contamination. Illuminated emergency exit signs were not observed throughout the facility. Emergency escape plans were not posted throughout the facility.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

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, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006

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

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

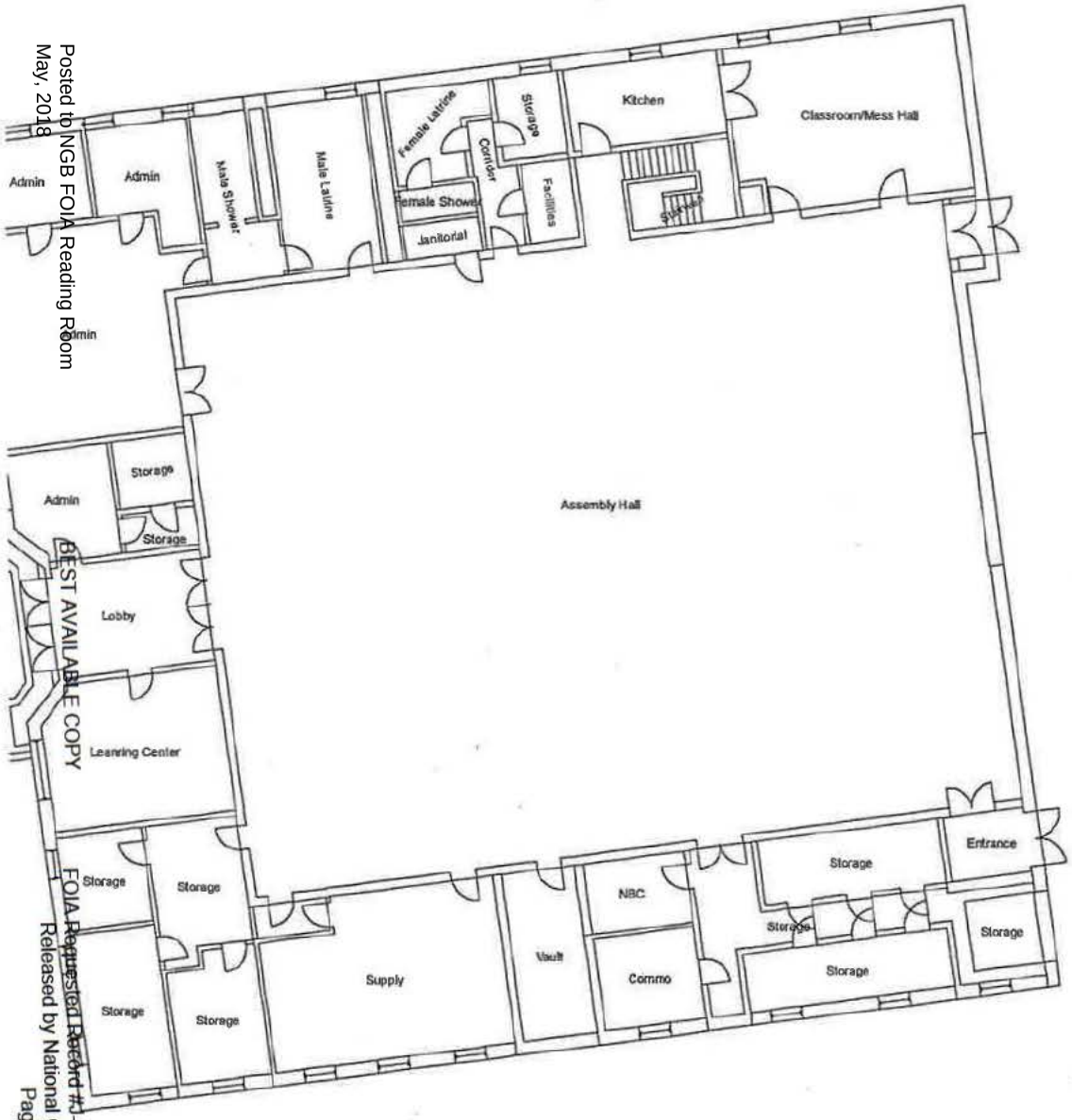
Standard for General Industry: 29 CFR 1910

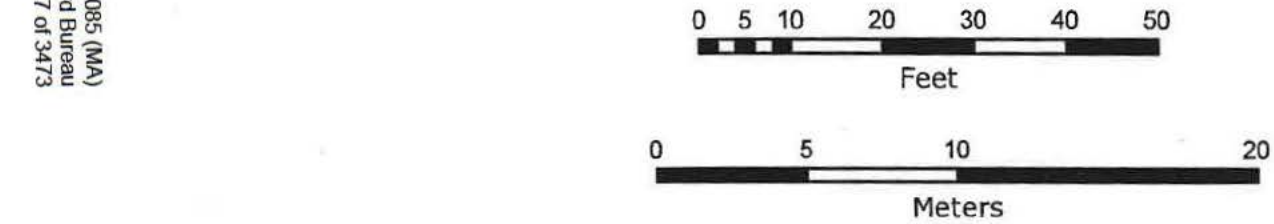
OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

APPENDIX A

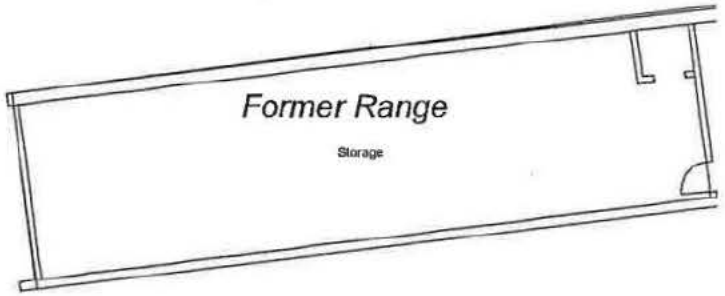
SHOP DRAWING

BRIDGEWATER





Basement Floor F



APPENDIX B

PERSONNEL LIST

Bridgewater Armory

576 Bedford Street

Bridgewater, MA 02324

Full Time Personnel,

189th EN TM (ASPHALT)

Non-Responsive

220th QM

Non-Responsive

APPENDIX C

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515614
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	576 Bedford Street, Bridgewater, MA	**Date Submitted:**	4/17/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Bridgewater RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	4/23/2013 **Report Date:** 4/23/2013

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
13054175	BridgewaterRC Wipe 01	Flame	Wipe	****	0.108	110	ug/ft^2	35	320	ug/ft^2	
13054176	BridgewaterRC Wipe 02	Flame	Wipe	****	0.108	110	ug/ft^2	17	160	ug/ft^2	
13054177	BridgewaterRC Wipe 03	Flame	Wipe	****	0.108	110	ug/ft^2	16	150	ug/ft^2	
13054178	BridgewaterRC Wipe 04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13054179	BridgewaterRC Wipe 05	Flame	Wipe	****	0.108	110	ug/ft^2	26	240	ug/ft^2	
13054180	BridgewaterRC Wipe 06	Flame	Wipe	****	0.108	110	ug/ft^2	58	530	ug/ft^2	
13054181	BridgewaterRC Wipe 07	Flame	Wipe	****	0.108	110	ug/ft^2	68	630	ug/ft^2	
13054182	BridgewaterRC Wipe 08	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13054183	BridgewaterRC Wipe 09	Flame	Wipe	****	0.108	110	ug/ft^2	790	7400	ug/ft^2	
13054184	BridgewaterRC Wipe 10	Flame	Wipe	****	0.108	110	ug/ft^2	32	300	ug/ft^2	
13054185	BridgewaterRC Wipe FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515614
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	576 Bedford Street, Bridgewater, MA	**Date Submitted:**	4/17/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Bridgewater RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	4/23/2013 **Report Date:** 4/23/2013

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
13054186	BridgewaterRC LBP 01	Flame	Paint Chip	****	N/A	0.0059 %Pb		0.24 %Pb	
13054187	BridgewaterRC LBP 02	Flame	Paint Chip	****	N/A	0.0068 %Pb		0.015 %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

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

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OWI (410) 247-2024

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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) **515614**

pg 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: MA ARNG
2. Job Location: 576 Bedford St, Bridgewater, MA
3. Job #: Bridgewater RC [redacted]
4. Contact Pers[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 ☐ Next Day ☐ 2 Day
☐ 3 Day ☒ 5 Day + Date Due: 4/24/13
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Includ[redacted]lth Report
☒ E[redacted] ...rs.com
☐ Fax: [redacted] us.army.mil
☐ Verb[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 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 2 (QTY)
☒ Pb Dust Wipe (wipe type ghost) 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)

SAMPLE INFORMATION / **ANALYSIS** / **MATRIX**

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Bridgewater RC Wipe-01	Admin	4/9/13		100cm2				X				X				
Bridgewater RC Wipe-02								X				X				
Bridgewater RC Wipe-03								X				X				
Bridgewater RC Wipe-04								X				X				
Bridgewater RC Wipe-05								X				X				
Bridgewater RC Wipe-06	Maintenance							X				X				
Bridgewater RC Wipe-07								X				X				
Bridgewater RC Wipe-08								X				X				
Bridgewater RC Wipe-09								X				X				
Bridgewater RC Wipe-10								X				X				
Bridgewater RC Wipe-FB	field blank			—				X				X				
Bridgewater RC LPP-01	gray paint							X			X					

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time:	Contact:	By:
Date/Time:	Contact:	By:
Date/Time:	Contact:	By:

[redacted]

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 4 / 11 / 13 @ 915 Via: FedEx By (Print): ____
2. Date/Time Analyzed: ___ / ___ / ___ @ ___ By (Print): ____
3. Results Reported To: ____ Date: ___ / ___ / ___ Initials: ____
4. Comments: ____

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515614 pg 2 of 2

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) 942-0264

Submittal Information:
1. Job Name: MA IABNG
2. Job Location: 5710 Bedford St., Bridgewater, MA
3. Job #: Bridgewater BC P.O. #: W912K8-09-A-0023
4. Contact Pers: Non-Responsive Non-Responsive
5. Submitted b: Non-Responsive

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

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:
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO
☐ Include COC/Field Data Sheets with Report
Non-Responsive .us.com
☐ Fa Non-Responsive @us.army.mil
☐ Ve @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 2 (QTY)
☒ Pb Dust Wipe (wipe type ghost) 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)

Microbial 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
Bridgewater BC LBP-01	gray paint	4/9/13					✓	X			X					
Bridgewater BC PLM-01	TSI wipe 100x100		1				X				X					
Bridgewater BC PLM-01B							X				X					
Bridgewater BC PLM-01C							X				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: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515614
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	576 Bedford Street, Bridgewater, MA	**Date Analyzed:**	4/23/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Bridgewater RC	**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
13054188	BridgewaterRC PLM 01A	40	40	--	--	--	--	--	20	--	--	40	PI	Off-White	Homogeneous	LBP	
13054189	BridgewaterRC PLM 01B	40	40	--	--	--	--	--	20	--	--	40	PI	Off-White	Homogeneous	LBP	
13054190	BridgewaterRC PLM 01C	40	40	--	--	--	--	--	20	--	--	40	PI	Off-White	Homogeneous	LBP	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515614
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	576 Bedford Street, Bridgewater, MA	**Date Analyzed:**	4/23/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Bridgewater RC	**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 Director Non-Responsive

Analyst(s) Non-Responsive

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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) 515614

pg 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: MA ARNG
2. Job Location: 5 Tio Bedford St, Bridgewater, MA
3. Job #: Bridgewater RC
4. Contact Pers[redacted]
5. Submitted[redacted]

Reporting Information (Results will be provide[redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: ☐ 24 Hours Time Due: Comments:	☐ Immediate ☐ Next Day ☐ 2 Day ☐ 3 Day ☒ 5 Day + Date Due: 4/24/13 ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Include COC/Field Data Sheets with Report ☒ [redacted] ☐ Fax: ☐ Verb[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 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 2 (QTY)
☒ Pb Dust Wipe (wipe type Ghost) 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)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE-TRAP	TAPE	SWAB
BridgewaterRC Wipe-01	Admin	4/9/13		100cm2				X				X				
BridgewaterRC Wipe-02								X				X				
BridgewaterRC Wipe-03								X				X				
BridgewaterRC Wipe-04								X				X				
BridgewaterRC Wipe-05								X				X				
BridgewaterRC Wipe-06	Maintenance							X				X				
BridgewaterRC Wipe-07								X				X				
BridgewaterRC Wipe-08								X				X				
BridgewaterRC Wipe-09								X				X				
BridgewaterRC Wipe-10								X				X				
BridgewaterRC Wipe-FB	field blank			—				X				X				
BridgewaterRC LPP-01	gray paint							X			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: 4/11/13 @ 9:15 Via: Fedex By (Print): [redacted]
2. Date/Time Analyzed: ___/___/___ @ ___ By (Print): ___
3. Results Reported To: ___ Via: ___ Date: ___/___/___ Time: ___ Initial: ___
4. Comments: ___

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pg 2 of 2

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: MA IABNG
2. Job Location: S/le Pratford St., Bridgewater, MA
3. Job #: Bridgewater BC
4. Contact Person: Non-Responsive
5. Submitted by: Non-Responsive

Reporting Information (Results will be provided

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Include COC with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	☐ Email: Non-Responsive @URS.com
Comments:	☐ 2 Day Date Due:	☐ Fax: Non-Responsive @us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ 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 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/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 2 (QTY)
- ☒ Pb Dust Wipe (wipe type Ghost) 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)

Microbiology 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	MATRIX: BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Bridgewater BC LEP-01	Drum Paint	4/9/13					X	X			X					
Bridgewater BC PLM-01	TSI pipe insulation						X				X					
Bridgewater BC PLM-02							X				X					
Bridgewater BC PLM-03							X				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: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

APPENDIX D

PHOTOGRAPHIC LOG

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Bridgewater RC	576 Bedford St., Bridgewater, MA	39743799

Photo No.	Date:
1	4/9/13

Description:

Blocked exit with no illuminated exit sign along the east building perimeter.

Photo No.	Date:
2	4/9/13

Description:

Overloaded book shelves in admin area south of the lobby.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Bridgewater RC	576 Bedford St., Bridgewater, MA	39743799

Photo No.	Date:
3	4/9/13

Description:

Evidence of water intrusion and suspect microbial growth in 220th QM Team offices.

Photo No.	Date:
4	4/9/13

Description:

Damaged presumed asbestos-containing floor tiles and exit with no emergency escape plan.

APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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

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.

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
BROCKTON READINESS CENTER
98 MONTAUK ROAD
BROCKTON, MASSACHUSETTS

April 2006
PN: 39741508

Non-Responsive
Office Manager

Non-Responsive
Project Manager

TABLE OF CONTENTS

Section **Page**

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APPENDICES

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 over half 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
Lead		
Lead was detected in wipe samples collected from the former firing range and 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 where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
Broken asbestos containing floor tile was found in hallways and a few other rooms. Exposed pipe and boiler insulation was found in the drill hall, administrative area and boiler room.	Remove and replace the broken floor tile with non-asbestos replacement floor tiles. Repair or remove exposed asbestos pipe and boiler insulation. 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 was not available.	Develop a site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
The hazard communication plan available was not site specific.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4
Emergency Exit Route Safety		
An emergency exit was obstructed.	Exit routes must be free and unobstructed. No materials or equipment may be placed, either permanently or temporarily, within the exit route (OSHA 29 CFR 1910.37(a)(3)).	RAC 2

FINDINGS AND RECOMMENDATIONS (Cont)

Findings	Recommendation	Risk Assessment Code
Fire Safety		
An obstructed fire extinguisher was found in the drill shed area.	Fire extinguishers must be made available when needed and that employees are not subjected to injury hazards when they try to obtain an extinguisher (OSHA 29 CFR 1910.157(c)(1)).	RAC 4
Mold		
Water stains and visible mold growth was observed throughout the building.	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		
Exposed electrical outlet was observed in Classroom #13	Cover live electrical outlets with approved outlet cover (OSHA 29 CFR1910.305(b)(2))	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 Readiness Center located at 98 Montauk Road in Brockton, Massachusetts 02301. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On February 10, 2004, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Readiness Center in Brockton, Massachusetts. 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. Mr. Non-Responsive of the State of Massachusetts was Mr. Non-Responsive site contact for this survey.

A drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

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. Computer workstation chairs and armrests were in a fixed position and keyboards could not be adjusted in several offices. If more than one person is using that station, then proper adjustments need to be made to accommodate each person.

Water marks and damage were observed on the ceilings of room #5 (Photo # 3662); room #19 (Photo # 3675); office #10 (Photo # 3681) and in lobby #8 (Photo # 33682). There was visible mold growth on a fiberglass insulated pipe riser in room #5 (Photo # 3663). Some of these areas could sustain mold growth if not addressed.

Some exposed electrical wires were found in classroom #13 (Photo # 3679).

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 18.2 – 30.4% with an average of 20.9%. This average reading was below the recommended level 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

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 359 to

561 parts per million (ppm), with an average of 377 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 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. Since the average interior carbon dioxide was below 700 ppm an exterior reading was not collected.

2.2.3 Carbon Monoxide

Carbon monoxide levels were also measured in the Readiness Center. Carbon monoxide concentrations remained at 0 ppm throughout the survey period. 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 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. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

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 Illuminance (foot candles)	Recommended Illuminance (foot candles)
Office # 7 – Desk by Drill Shed	Administrative Duties	72	50
Office # 7 – Desk by Window	Administrative Duties	107	50
Office # 9	Administrative Duties	138	50
Office # 10	Administrative Duties	15	50
Office # 11	Administrative Duties	161	50
Office # 12	Administrative Duties	53	50
Office # 15	Administrative Duties	32	50
Office # 16	Administrative Duties	47	50
Office # 17	Administrative Duties	40	50
Office # 18	Administrative Duties	43	50
Office # 19	Administrative Duties	54	50
Hallway # 4	Accessway	32	3
Hallway # 14	Accessway	22	3
Lobby # 8	Accessway	41	3

On the day of the survey the illuminance in the administrative area was inadequate in approximately half the offices.

2.2.5 Lead

Wipe testing for lead was conducted in the administration 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 Administration Area

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Surface Contamination Level ($\mu g/ft^2$)
Room #24 – Top of Shelves	0210-LW11	1.000	33	200
Kitchen #6 – Top of Refrigerator	0210-LW12	1.000	29	200
Office #10 – Floor	0210-LW13	1.000	60	200
Office #19 – Window Sill	0210-LW14	1.000	48	200
Office #18 – Floor	0210-LW15	1.000	47	200
Hall #14 – Window Sill	0210-LW16	1.000	32	200
Blank	0210-LW Blank2	N/A	<12 µg	N/A

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 2-3 below presents the results of the sample analysis.

Table 2-3
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Hallway # 4	12"x12" Red Floor Tile	0210-AB03A-FT	2 (chrysotile)
Hallway # 4	12"x12" Red Floor Tile	0210-AB03B-FT	2 (chrysotile)
Hallway # 4	Associated Mastic	0210-AB03A-M	3 (chrysotile)
Hallway # 4	Associated Mastic	0210-AB03B-M	2 (chrysotile)
Mess Hall # 5	9"x9" Black Floor Tile	0210-AB04A-FT	2 (chrysotile)
Mess Hall # 5	9"x9" Black Floor Tile	0210-AB04B-FT	2 (chrysotile)
Mess Hall # 5	Associated Mastic	0210-AB04A-M	3 (chrysotile)

Table 2-3 (Continued)
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Mess Hall # 5	Associated Mastic	0210-AB04B-M	3 (chrysotile)
Mess Hall # 5	4" Black Cove Base	0210-AB05A	NAD
Mess Hall # 5	4" Black Cove Base	0210-AB05B	NAD
Classroom # 13	12"x12" Cream Floor Tile	0210-AB06A-FT	2 (chrysotile)
Room # 12	12"x12" Cream Floor Tile	0210-AB06B-FT	2 (chrysotile)
Classroom # 13	Associated Mastic	0210-AB06A-M	3 (chrysotile)
Room # 12	Associated Mastic	0210-AB06B-M	3 (chrysotile)
Room # 10	9"x9" Brown Floor Tile	0210-AB07A-FT	3 (chrysotile)
Room # 10	9"x9" Brown Floor Tile	0210-AB07B-FT	3 (chrysotile)
Room # 10	Associated Mastic	0210-AB07A-M	NAD
Room # 10	Associated Mastic	0210-AB07B-M	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.

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.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in approximately half the offices. URS recommends increasing lighting

through the use of task lighting in the administrative areas. While work is in progress, the administrative area must be lighted by at least the minimum light intensities.

ASBESTOS: Damaged asbestos-containing floor tile found in hallway #4 (Photo # 3659), mess hall #5 (Photo # 3660), classroom #13 (Photo # 3678) and room #10 (Photo # 3680). Exposed asbestos-containing pipe insulation was found in room #22 (Photo # 3666-67), mess hall #5 (Photo # 3664), shower room #24 (Photo # 3665), room #24 (Photos # 3668-69), room #25 (Photo # 3670), room #27, room #28 (Photo # 3671), room #19 (Photo # 3676). It is recommended that the damaged tiles be replaced with new, non-asbestos tile. The exposed asbestos insulation needs to be removed or repaired. The work should be performed by an appropriately trained licensed technician.

MOLD: The water stains on the ceilings could lead to mold problems if not addressed.

ELECTRICAL: Exposed electrical wires (Photo #3679) were observed in Classroom #13.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The 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 ($\mu g/ft^2$)
Firing Range-Top of Light Guard	0210-LW06	1.000	940	200
Firing Range-Top of a Locker	0210-LW07	1.000	190	200
Firing Range-Top of a Book Shelf	0210-LW08	1.000	46	200
Firing Range-Floor – Front	0210-LW09	1.000	380	200
Firing Range-Floor - Rear	0210-LW10	1.000	420	200
Blank	0210-LWBlank	N/A	<12	200

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
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	0210-LA02	936	<3.2	50.0
Blank	0210-LA03	0	<3.0	50.0

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 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

One paint chip was collected in the former firing range 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 3-3 below shows the results of the lead paint testing.

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

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Former Firing Range	0210-LPC04	0.01	0.013

The analytical report from AMA is contained in Appendix D.

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: Three of the five surface wipe samples collected in the former firing range were found to contain lead dust levels which exceeded the maximum limit set by the National Guard Bureau Region North Industrial Hygiene Office (See Appendix G). URS recommends that an appropriately licensed lead contractor clean the former firing range. Appendix H contains guidelines for the cleanup and rehabilitation of indoor firing ranges.

ASBESTOS: There is some damage to the asbestos-containing pipe insulation adjacent to the air-handling unit (Photo # 3690). This material should be repaired by a properly trained licensed technician.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 7,000 square foot area used for assembling personnel and storing equipment. 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 – Top of Coca Cola Machine	0210-LW01	1.000	220	200
Drill Hall – Top of a Locker	0210-LW02	1.000	95	200
Drill Hall – Floor – Front	0210-LW03	1.000	37	200
Drill Hall – Floor – Center	0210-LW04	1.000	110	200
Drill Hall – Floor – Rear	0210-LW05	1.000	180	200
Blank	0210-LWBlank	N/A	<12	200

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

Table 4-2
Levels 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	0210-LA01	972	<3.1	50.0
Blank	0210-LA03	0	<3.0	50.0

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 50.0 $\mu g/m^3$ 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: One of the five surface wipe samples collected in the drill hall was found to contain lead dust levels which exceeded the maximum limit set by the National Guard Bureau (See Appendix G). URS recommends that an appropriately licensed lead contractor clean the drill hall.

ASBESTOS: The duct tape repairs on the asbestos-containing pipe insulation need to be properly repaired with wet wrap. There are still some exposed ends where the duct tape repairs were made (Photo # 3673).

FIRE SAFETY: A blocked fire extinguisher (Photo # 3672) and emergency exit (Photo # 3674) were noticed in the drill hall. The fire extinguisher and emergency exit need to be kept clear of any obstructions.

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

Paint chips were collected where paint was peeling and sent to AMA for analysis. The samples were found to contain lead in a concentration within 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 5-1 below shows the results of the lead paint testing.

Table 5-1
Levels of Lead in Paint Found in the Boiler Room

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room # 1	0210-LPC01	0.01	<0.011
Boiler Room # 1	0210-LPC02	0.01	0.012
Boiler Room # 1	0210-LPC03	0.01	0.069

The analytical report from AMA is contained in Appendix D.

5.2.2 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 5-2 below shows the results of these samples.

Table 5-2
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Boiler Room #1	Pipe Insulation	0210-01A	50
Boiler Room #1	Pipe Insulation	0210-01B	50
Boiler Room #1	Pipe Insulation	0210-01C	50
Boiler Room #1	Boiler Exhaust Pipe Insulation	0210-02A	20
Boiler Room #1	Boiler Exhaust Pipe Insulation	0210-02B	40
Boiler Room #1	Boiler Exhaust Pipe Insulation	0210-02C	40

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.

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 paint chip samples collected in the boiler room for lead were found to contain levels of lead within the acceptable range of the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines.

ASBESTOS: The boiler exhaust and pipe run insulation have exposed sections. It is recommended that the exposed sections (Photos # 3654-55) be removed or repaired. The work should be performed by an appropriately trained licensed technician.

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

The hearing conservation program was found in the safety book, under tab M, chapter 3. No training records were found on site. A hearing conservation program is not required for this site.

6.3 Respiratory Protection

The respiratory protection program was found in the safety book, under tab M, chapter 4. No training records were found on site. A respiratory protection program is not required for this site.

6.4 Hazard Communication

The hazard communication program was found in the safety book, under tab L. No training records were found on site. An Operations and Maintenance (O & M) plan is required for this site which would cover the issues with asbestos.

6.5 Personal Protective Equipment

The personal protective equipment program was found in the safety book, under tab N, chapter 10. No training records were found on site. A personal protective equipment program is not required for this site.

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

APPENDIX A

READINESS CENTER DRAWING

APPENDIX B

PERSONNEL LIST

PERSONEL LIST
BROCKTON ARMORY

Name	Rank
Non-Responsive	SFC
	SGT
	MSG
	CIV
	SFC

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122964
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	98 Montauk Road Brockton, MA	**Date Analyzed:**	02/24/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	24-Feb-04
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
0426254	0210-LW 01	Flame	Wipe	****	1.000	12.00	ug/ft²		220	ug/ft²	
0426255	0210-LW 02	Flame	Wipe	****	1.000	12.00	ug/ft²		95	ug/ft²	
0426256	0210-LW 03	Flame	Wipe	****	1.000	12.00	ug/ft²		37	ug/ft²	
0426257	0210-LW 04	Flame	Wipe	****	1.000	12.00	ug/ft²		110	ug/ft²	
0426258	0210-LW 05	Flame	Wipe	****	1.000	12.00	ug/ft²		180	ug/ft²	
0426259	0210-LW 06	Flame	Wipe	****	1.000	12.00	ug/ft²		940	ug/ft²	
0426260	0210-LW 07	Flame	Wipe	****	1.000	12.00	ug/ft²		190	ug/ft²	
0426261	0210-LW 08	Flame	Wipe	****	1.000	12.00	ug/ft²		46	ug/ft²	
0426262	0210-LW 09	Flame	Wipe	****	1.000	12.00	ug/ft²		380	ug/ft²	
0426263	0210-LW 10	Flame	Wipe	****	1.000	12.00	ug/ft²		420	ug/ft²	
0426264	0210-LW BLANK	Flame	Wipe	****	N/A	12.00	ug	<	12	ug	
0426265	0210-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	<	0.011	%Pb	
0426266	0210-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb		0.012	%Pb	
0426267	0210-LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb		0.069	%Pb	
0426268	0210-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb		0.013	%Pb	
0426269	0210-LA 01	Flame	Air	972	N/A	3.09	ug/m³	<	3.1	ug/m³	
0426270	0210-LA 02	Flame	Air	936	N/A	3.21	ug/m³	<	3.2	ug/m³	
0426271	0210-LA 03	Flame	Air Blank	0	N/A	3.00	ug/m³	<	3	ug	

AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

NVLAP
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AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122964
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	98 Montauk Road Brockton, MA	**Date Analyzed:**	02/24/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	24-Feb-04

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

Analyst: [redacted] Non-Responsive

nical Manager: [redacted]

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122964
Address:	301-III Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	98 Montauk Road Brockton, MA	**Date Analyzed:**	2/24/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**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	Analyst ID	Comments
0426272	0210-AB 01 A	50	50	--	--	--	--	--	20	--	--	30	Gray	LB	
0426273	0210-AB 01 B	50	50	--	--	--	--	--	20	--	--	30	Gray	LB	
0426274	0210-AB 01 C	50	50	--	--	--	--	--	20	--	--	30	Gray	LB	
0426275	0210-AB 02 A	20	5	15	--	--	--	--	--	--	--	80	White	LB	
0426276	0210-AB 02 B	40	40	--	--	--	--	--	--	--	--	60	Gray	LB	
0426277	0210-AB 02 C	40	40	--	--	--	--	--	--	--	--	60	Off-White	LB	
0426278	0210-AB 03 A-FT	2	2	--	--	--	--	--	TR	--	--	98	Red	LB	
0426279	0210-AB 03 B-FT	2	2	--	--	--	--	--	--	--	--	98	Red	LB	
0426280	0210-AB 03 A-M	3	3	--	--	--	--	--	TR	--	--	97	Black	LB	
0426281	0210-AB 03 B-M	2	2	--	--	--	--	--	TR	--	--	98	Black	LB	
0426282	0210-AB 04 A-FT	2	2	--	--	--	--	--	--	--	--	98	Black	LB	
0426283	0210-AB 04 B-FT	2	2	--	--	--	--	--	--	--	--	98	Black	LB	
0426284	0210-AB 04 A-M	3	3	--	--	--	--	--	TR	--	--	97	Black	LB	
0426285	0210-AB 04 B-M	3	3	--	--	--	--	--	TR	--	--	97	Black	LB	

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CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122964
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	98 Montauk Road Brockton, MA	**Date Analyzed:**	2/24/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**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	Analyst ID	Comments
0426286	0210-AB 05 A	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0426287	0210-AB 05 B	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0426288	0210-AB 06 A-FT	2	2	--	--	--	--	--	--	--	--	98	Gray	LB	
0426289	0210-AB 06 B-FT	2	2	--	--	--	--	--	--	--	--	98	Gray	LB	
0426290	0210-AB 06 A-M	3	3	--	--	--	--	--	TR	--	--	97	Black	LB	
0426291	0210-AB 06 B-M	3	3	--	--	--	--	--	--	--	TR	97	Black	LB	
0426292	0210-AB 07 A-FT	3	3	--	--	--	--	--	--	--	--	97	Brown	LB	
0426293	0210-AB 07 B-FT	3	3	--	--	--	--	--	--	--	--	97	Brown	LB	
0426294	0210-AB 07 A-M	NAD	--	--	--	--	--	--	TR	--	--	100	Brown	LB	
0426295	0210-AB 07 B-M	NAD	--	--	--	--	--	--	--	--	--	100	Brown	LB	

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CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122964
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	98 Montauk Road Brockton, MA	**Date Analyzed:**	2/24/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**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	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]

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

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:**	138223		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Brockton, MA	**Date Submitted:**	5/20/2005		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**			
		P.O. Number:	Not Provided	**Date Analyzed:**	5/25/2005	**Report Date:**	25-May-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
0540419	0210-LW11	Flame	Wipe	****	1.000	12.00	ug/ft²	33	ug/ft²	
0540420	0210-LW12	Flame	Wipe	****	1.000	12.00	ug/ft²	29	ug/ft²	
0540421	0210-LW13	Flame	Wipe	****	1.000	12.00	ug/ft²	60	ug/ft²	
0540422	0210-LW14	Flame	Wipe	****	1.000	12.00	ug/ft²	48	ug/ft²	
0540423	0210-LW15	Flame	Wipe	****	1.000	12.00	ug/ft²	47	ug/ft²	
0540424	0210-LW16	Flame	Wipe	****	1.000	12.00	ug/ft²	32	ug/ft²	
0540425	0210-LW Blank2	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	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.

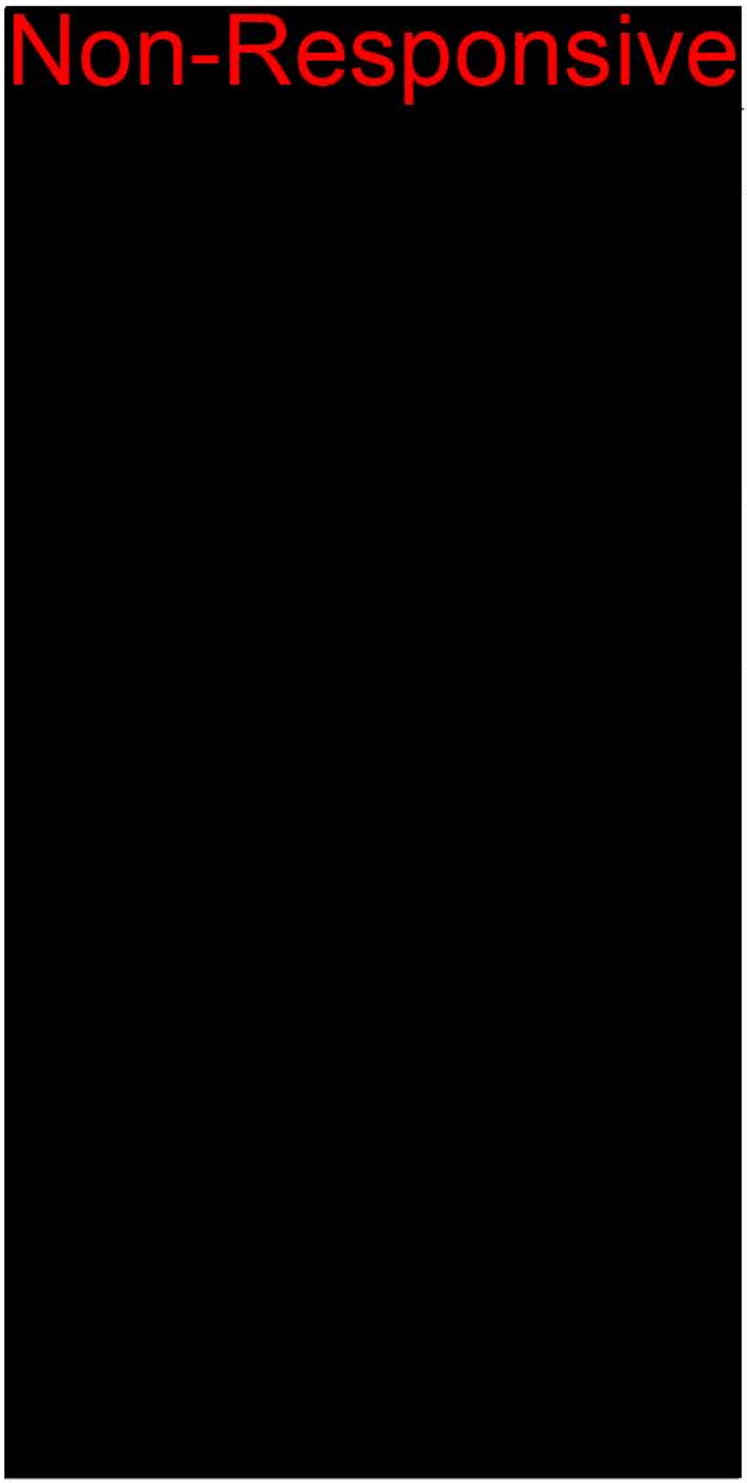
Air and Wipe results are not corrected for any blank results

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted]

APPENDIX E

TRAINING CERTIFICATES


Non-Responsive

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 as:

Asbestos Inspector Refresher

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

April 11, 2003
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

03518010625349
Certificate Number

April 10, 2004
Expiration Date

[redacted]
President/Director of Training

APPENDIX F

PHOTOGRAPHS

Photo 3654: Boiler Room – Damaged asbestos-containing pipe insulation

Photo 3655: Boiler Room – Damaged Asbestos-containing boiler exhaust insulation

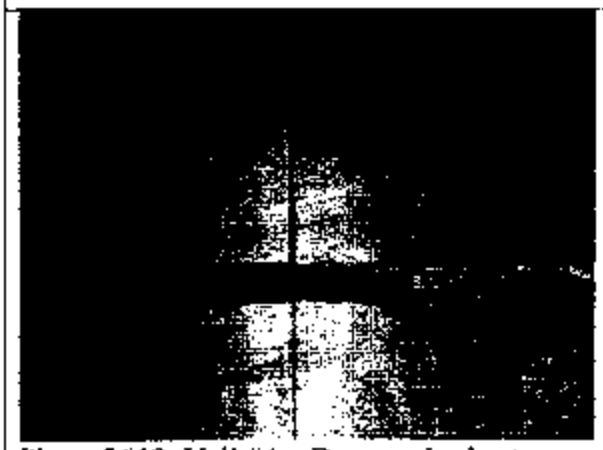


Photo 3659: Hall #4 – Damaged asbestos-containing floor tile

Photo 3660: Mess Hall #5 – Damaged asbestos-containing floor tile

Photo 3662: Mess Hall #5 – Water stained ceiling tiles

Photo 3663: Mess Hall #5 – Visible mold on fiberglass pipe insulation

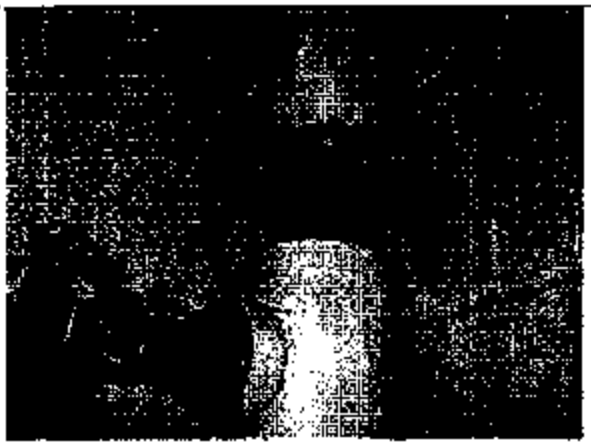


Photo 3664: Mess Hall #5 – Damaged asbestos-containing pipe insulation

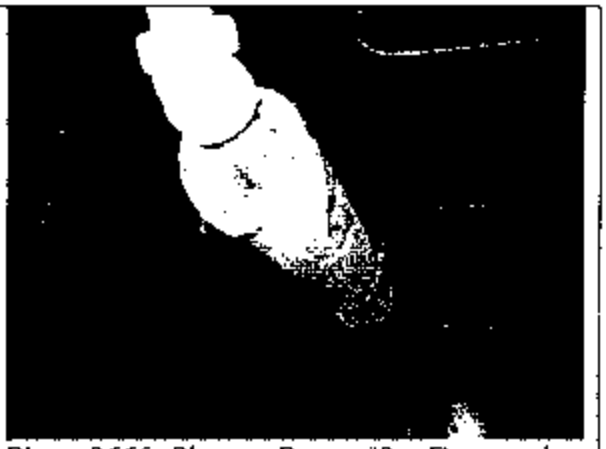


Photo 3665: Shower Room #3 – Damaged asbestos-containing pipe insulation

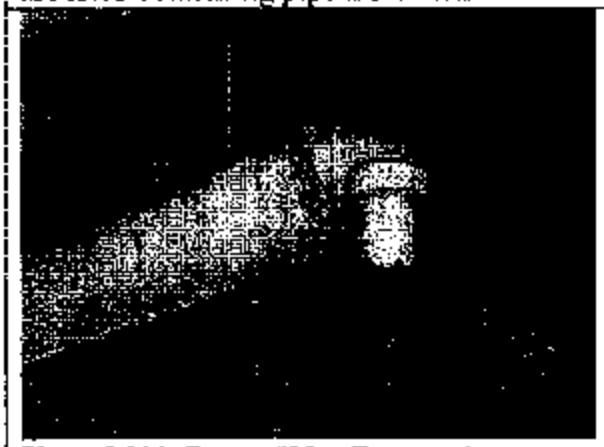


Photo 3666: Room #22 – Damaged asbestos-containing pipe insulation

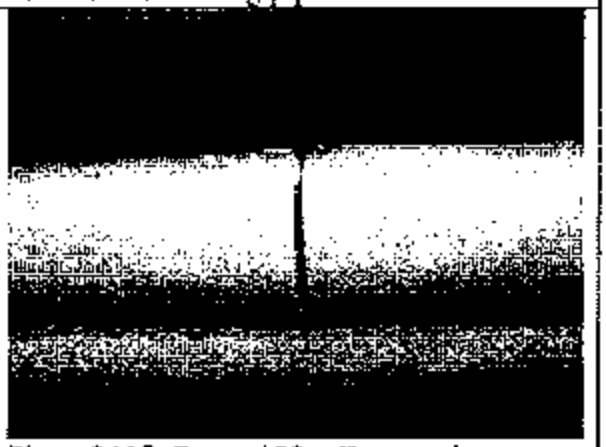


Photo 3667: Room #22 – Damaged asbestos-containing pipe insulation

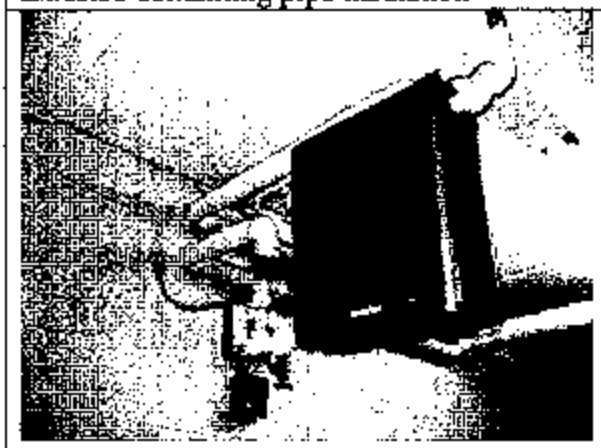


Photo 3668: Room #24 – Damaged asbestos-containing pipe insulation

Photo 3669: Room #24 – Damaged asbestos-containing pipe insulation

Photo 3670: Room #25– Damaged asbestos-containing pipe insulation

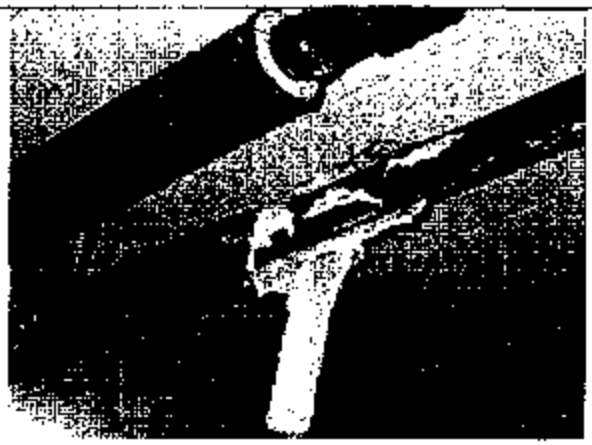


Photo 3671: Room #28 – Damaged asbestos-containing pipe insulation

Photo 3672: Drill Shed #21 – Obstructed fire extinguisher

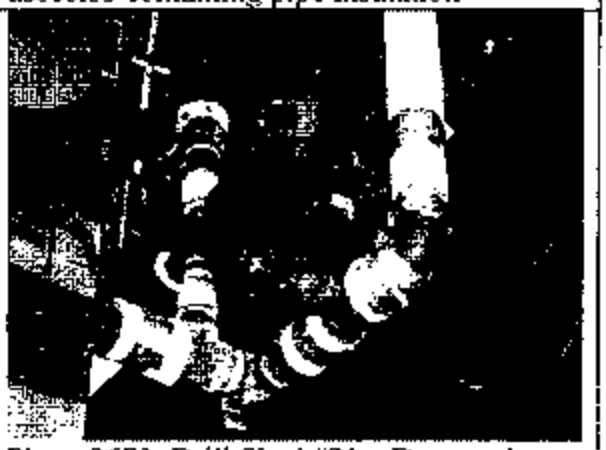


Photo 3673: Drill Shed #21 – Damaged asbestos-containing pipe insulation

Photo 3674: Drill Shed #21 – Obstructed fire exit

Photo 3675: Room #19 – Water stained ceiling tiles

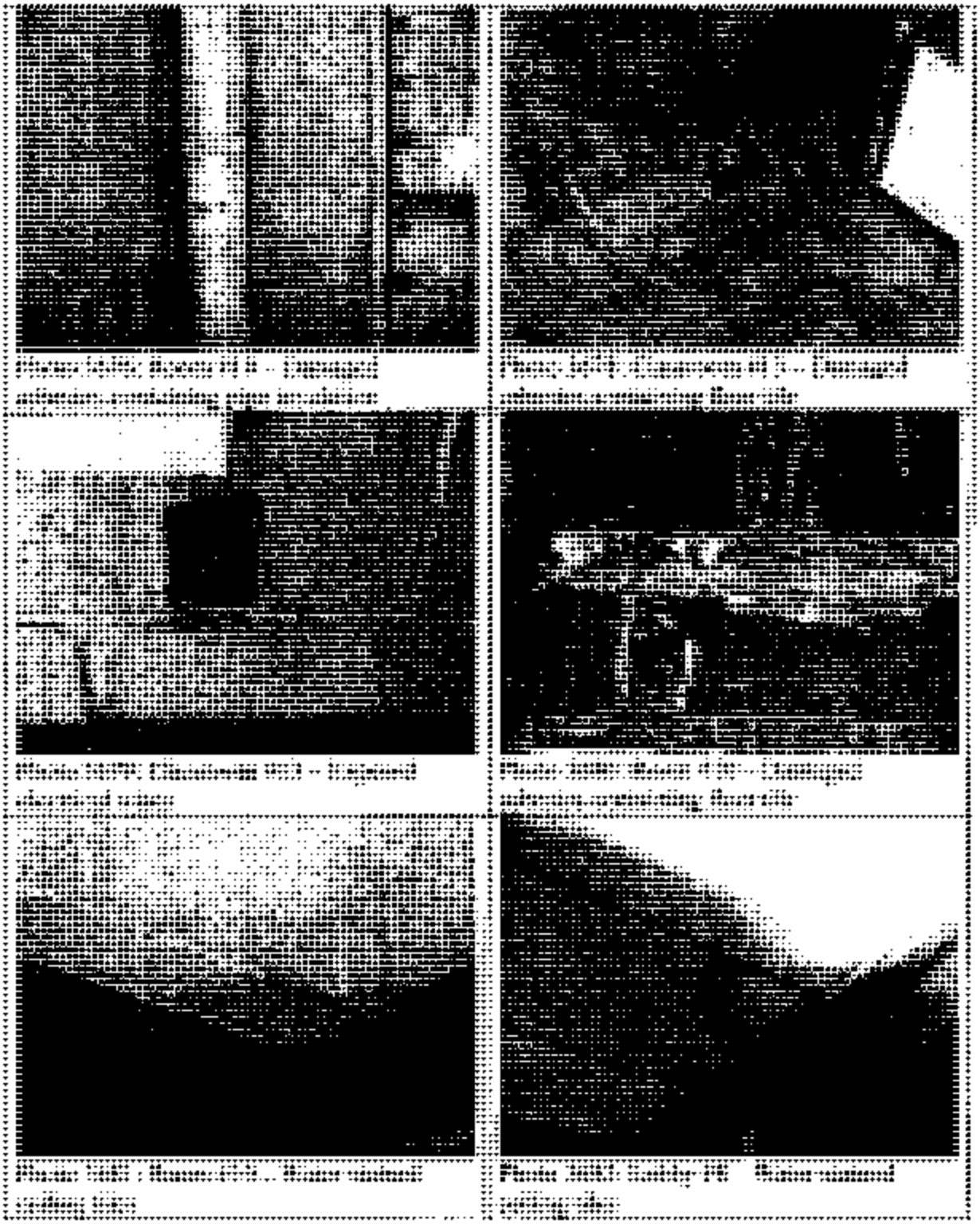


Photo 3690: Former Firing Range – Damaged asbestos-containing pipe insulation

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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.

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.

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)

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

ADDENOUM

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).

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.

[redacted]

(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.

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.

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.

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

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

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. Ashby 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.

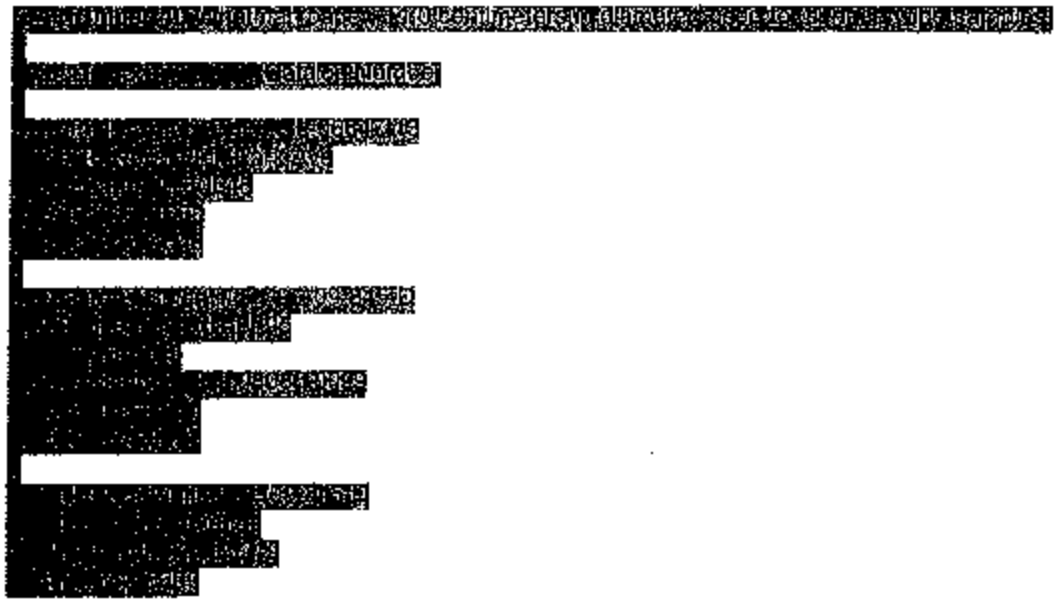
	Order From	Catalog Number
a.	Supelco Inc Supelco Park Bellefonte PA 16823	2-3381M

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. 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

APPENDIX E (Continued)

800-255-6324

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:

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

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

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

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:

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		

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

APPENDIX 1 (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.

Industrial Hygiene Survey

Massachusetts Army National Guard (MA ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Brockton Readiness Center

98 Montauk Road
Brockton, MA 02301

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

Survey Date: August 19, 2010
Report Date: September 30, 2010

AEI Project #: J10-515 3d MA Brockton RC

_____

Non-Responsive

Industrial Hygienist

Table of Contents

List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Readiness Center located at 98 Montauk Road, Brockton, MA, 02301. Non-Responsive performed the evaluation on August 19, 2010. The point of contact for the facility was Sergeant First Class 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) evaluations of operations including operation description, 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:

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.

Lead in Air Samples: Lead in air samples to determine if any airborne contamination of lead existed in the facility were not collected at the Brockton Readiness Center due to sample pump malfunction.

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 areas of peeling or flaking paint were observed. Three wipe samples collected from the former firing range that has not been converted and is being used for storage were above the National Guard criteria for lead contamination (200 µg/ft^2). Samples ranged from 2.1 to 8 times the National Guard criteria. Lead was identified in samples collected from the overhead heater vent, the exhaust ventilation fan, and on the floor of the range. Additionally, the wipe sample taken from the air intake to the overhead heaters in the Drill Hall was also above National Guard criteria.

Visual Inspection for Damaged Asbestos-Containing Materials: The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. The bulk sample of the pipe insulation was reported to contain 45% Chrysotile asbestos. Damaged TSI pipe insulation was observed in the Drill Hall adjacent to the former firing range.

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. Several water leaks were observed in the men's room showers, the mess hall and where roof drains penetrate the roof deck. No mold was observed in the facility.

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 that there are some illumination deficiencies in the weight room and copy room. The illumination measurements indoors ranged from a low of 14.4 foot candles (fc) to a high of 200.3 fc.

Indoor Air Quality: Temperatures and relative humidity measurements were all acceptable on the day of monitoring except in the weight room, supply room and the men's room. Indoor levels of CO_2 ranged from 384 to 973 parts per million (ppm) and outdoor CO_2 levels were approximately 410 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange. Indoor levels of CO ranged from 0 to 0.6 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Massachusetts Army National Guard (MA ARNG) Readiness Center located at 98 Montauk Road, Brockton, MA 02301. Non-Responsive performed the evaluation on August 19, 2010. The point of contact for the facility was Sergeant First Class 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) evaluations of operations including operation description, 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:

The Brockton Readiness Center is staffed with 9 administrative 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 Brockton 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 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 Brockton facility consists exclusively of supply and administrative duties. No maintenance of vehicles, painting of equipment or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer 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

Heat is supplied to the facility through a boiler located in the boiler room and overhead heaters in the drill hall. The boiler certificate for the Braintree facility expired in 1988 and is not up to date. Any air conditioning provided to the building is through window air conditioning units. No local ventilation systems were present at 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 water damage or mold problems; potential ergonomic problems; and housekeeping practices. Lighting and indoor air quality measurements were taken in all areas of the facility as well.

Lead in Air Samples

Lead in air samples to determine if any airborne contamination of lead existed in the facility were not collected at the Brockton Readiness Center due to sample pump malfunction.

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 areas of peeling or flaking paint were 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 10cm x 10cm templates. Wipe samples for surface dust were collected in 19 locations. The Environmental Protection Agency (EPA) and the Commonwealth of Massachusetts 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 Center for Health Promotion and Preventive Medicine (USACHPPM) 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 Aerosol Monitoring and Analysis Analytical Services, Inc. (AMA) for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Three samples collected from the former firing range were above the National Guard criteria for lead contamination (200 µg/ft^2). Samples ranged from 2.1 to 8 times the National Guard criteria. Lead was identified in samples collected from the overhead heater vent, the exhaust ventilation fan, and on the floor of the range. Additionally, the wipe sample taken from the air intake to the overhead heaters in the Drill Hall was also above National Guard criteria. The history of the indoor firing range was not known to current employees at the Readiness Center. It appeared not to have been converted in accordance with NG PAM 420-15 and it was being used for storage. Results are given in Table 1 and certificates of analysis are included in Appendix B

Table 1 – Results of Dust Wipe Sampling for MA ARNG Brockton Readiness Center on August 19, 2010.

Wipe Sample #	Sample Location	Result (µg/ft²)*
BRO-PB-01	Room 5, Air Supply at Radiator	<110
BRO-PB-02	Kitchen, Prep Table	<110
BRO-PB-03	Drill Hall, From Air Intake to Overhead Heater	**1,900**
BRO-PB-04	Drill Hall, Middle of Floor	<110
BRO-PB-05	Drill Hall, Exhaust Vent from Overhead Heater	<110
BRO-PB-06	Room 15**, Exhaust Ventilation Fan	**730**
BRO-PB-07	Room 15**, Light Fixture	<110
BRO-PB-08	Room 15**, Overhead Heater Intake	**1,600**
BRO-PB-09	Room 15**, Stored Footlocker	<110
BRO-PB-10	Room 15**, Middle of Floor Adjacent to Cage	**420**
BRO-PB-11	Drill Hall, Immediately Outside Former Range	<110
BRO-PB-12	Room 31, Desktop	<110
BRO-PB-13	Room 30, Top of Supply Cabinet	160
BRO-PB-14	Room 29, Training Mat	<110
BRO-PB-15	Room 23, Window Sill	<110
BRO-PB-16	Room 3, Top of Bookshelf	<110
BRO-PB-17	Room 7, Desktop	<110
BRO-PB-18	Room 9, Top of File Cabinet	<110
BRO-PB-19	Room 12, Window Sill	<110

*The US Army CHPPM recommends a maximum level for adult exposures of 200 µg/ft² lead on floors
**Room 15 is a former indoor firing range that has not been converted and is being used for storage

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 TSI pipe insulation was observed in Drill Hall adjacent to the former firing range. One bulk sample was collected and submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM) using EPA method 600/R-93/116. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. The submitted sample of the pipe insulation was reported to contain 45% Chrysotile asbestos. Results are given in Table 2 and certificates of analysis are included in Appendix B.

Table 2 – Results of Asbestos Sampling for the MA ARNG RC Brockton, MA on August 19, 2010.

Bulk Sample #	Sample Location	Result (%)
BRO-ASB-01	Drill Hall, by Room 15 on Damaged Bottom Pipe	45% Chrysotile

*Asbestos containing material is

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. Several water leaks were observed in the men's room showers, the mess hall and were roof drains penetrate the roof deck. No mold was observed in the facility.

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

Illumination levels were measured using a Cal-Light 400L, calibrated on July 30, 2009, 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 that there are some illumination deficiencies in the weight room and copy room. The illumination measurements indoors ranged from a low of 14.4 foot candles (fc) to a high of 200.3 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination. Additional illumination can be achieved by replacing burned-out lamps, cleaning fixtures, relocating detailed work to more illuminated areas, using supplemental task lighting, and opening doors or windows to provide more natural lighting.

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 2010. 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 55-2004. 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 G 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 55-2004

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 74.5 to 79.5° F and 56.5 to 66.6% Rh. Outdoor temperature and humidity measurements were 77° F and 60% on the day of monitoring. Temperatures and relative humidity measurements were all acceptable on the day of monitoring except in the weight room, supply room and the men's room.

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 – 2007 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 384 to 973 parts per million (ppm) and outdoor CO_2 levels were approximately 410 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange.

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 62.1-2007 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 to 0.6 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, peeling potentially lead-based paints, noise hazards, indoor air quality, visible mold, lighting and housekeeping. The results of the evaluation indicated industrial hygiene concerns in the following areas: cross contamination from the former firing range, water intrusion, lighting and the presence of damaged suspect asbestos-containing materials. Overall, Brockton Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees.

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.

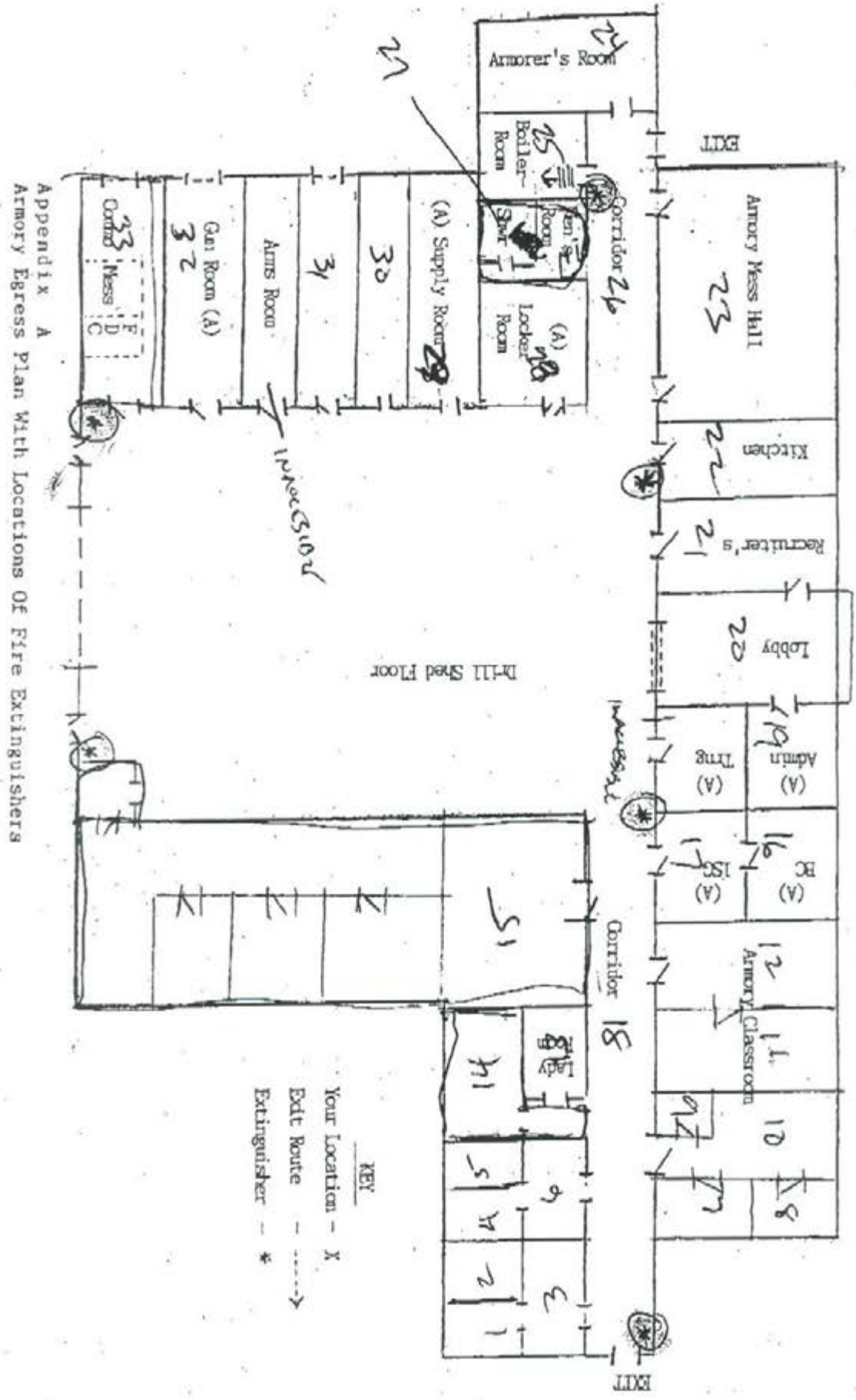
9 References

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, August 23, 2007.
6. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 15, 1998.
7. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
8. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
9. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
10. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
11. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2007, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2004, "Thermal Environmental Conditions for Human Occupancy".
12. NIOSH website: http://www.cdc.gov/niosh/
13. OSHA website: http://www.osha.gov/.
14. Army CHPPM website: http://chppm-www.apgea.army.mil/.
15. EPA website: http://www.epa.gov.

Appendix A
Building Layout

Appendix A
Armory Egress Plan With Locations Of Fire Extinguishers

FIRE EVACUATION PLAN



Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Brockton Readiness Center	**Chain Of Custody:**	508621
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Brockton, MA	**Date Analyzed:**	8/29/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**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 Color	Homogeneity	Analyst ID	Comments
1073160	BRO-ASB-01	45	45	--	--	--	5	--	--	--	--	50	Off-White	Homogeneous	PC	

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 Directo Non-Responsive **Analyst(s)** Non-Responsive

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) **508621**

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: BROCKTON READINESS CENTER
2. Job Location: BROCKTON MA
3. Job #:
4. Contact Perso
5. Submitted by:

Non-Responsive Non-Responsive

Reporting Information (Results will be provided

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Incl h Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	☒ Ema ARIA@VLNO.COM
Comments:	☐ 2 Day Date Due: 8/30/10	☐ Fax: us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ Ver us.army.mil

Non-Responsive

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 6 (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)
- ☐ Pb Dust Wipe (wipe type GHOST) 19 (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	MATRIX: DUST	WATER AND OTHERS	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
BRO-PB-01		8/11/10		10x10cm				Y				X					Date/Time: Contact: By:
BRO-PB-02																	
BRO-PB-03																	
BRO-PB-04																	
BRO-PB-05																	Date/Time: Contact: By:
BRO-PB-06																	
BRO-PB-07																	
BRO-PB-08																	
BRO-PB-09																	Date/Time: Contact: By:
BRO-PB-10																	
BRO-PB-11																	
BRO-PB-12																	

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 8/23/10 @ 1015 Via: FED
2. Date/Time Analyz
3. Results Reported
4. Comments:

Non-Responsive Non-Responsive

Released by National Guard Bureau

OWI (410) 247-2024 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)

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: SAME
2. Job Location:
3. Job #: P.O. #: W912K6-09-A-0000 Non-Responsive
4. Contact Person: Non-Responsive
5. Submitted by:

Reporting Information (Results will be provided

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Include COC/Field Data Sheets with Report
☐ 24 Hours Time Due:	☐ Next Day ☐ 5 Day +	☒ Email: Non-Responsive
Comments:	☐ 2 Day Date Due:	☐ Fax: us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ 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 (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)
- ☐ Pb Dust Wipe (wipe type) (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	CLIENT CONTACT (LABORATORY STAFF ONLY)
BNO -PB -13		5/19/10		10x10cm				X				X					Date/Time: Contact: By:
BNO -PB -14																	
BNO -PB -15																	
BNO -PB -16																	
BNO -PB -17																	Date/Time: Contact: By:
BNO -PB -18																	
BNO -PB -19																	
BNO -ASB-01							X				X						
																	Date/Time: Contact: By:

Non-Responsive

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: / / @ Via: By (Print): Sig
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

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
LAP #100470

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Brockton Readiness Center	**Chain Of Custody:**	508621		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Brockton, MA	**Date Submitted:**	8/23/2010		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/29/2010	**Report Date:**	8/29/2010

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
1073141	BRO-PB-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073142	BRO-PB-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073143	BRO-PB-03	Flame	Wipe	****	0.108	110	ug/ft²	200	1900	ug/ft²	
1073144	BRO-PB-04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073145	BRO-PB-05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073146	BRO-PB-06	Flame	Wipe	****	0.108	110	ug/ft²	78	730	ug/ft²	
1073147	BRO-PB-07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073148	BRO-PB-08	Flame	Wipe	****	0.108	110	ug/ft²	170	1600	ug/ft²	
1073149	BRO-PB-09	Flame	Wipe	****	0.105	110	ug/ft²	<12	<110	ug/ft²	
1073150	BRO-PB-10	Flame	Wipe	****	0.108	110	ug/ft²	45	420	ug/ft²	
1073151	BRO-PB-11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073152	BRO-PB-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073153	BRO-PB-13	Flame	Wipe	****	0.108	110	ug/ft²	17	160	ug/ft²	
1073154	BRO-PB-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073155	BRO-PB-15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073156	BRO-PB-16	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073157	BRO-PB-17	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073158	BRO-PB-18	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1073159	BRO-PB-19	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

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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

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Brockton Readiness Center	**Chain Of Custody:**	508621
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Brockton, MA	**Date Submitted:**	8/23/2010
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/29/2010
				Report Date:	8/29/2010

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)-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) 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 sampes.
NY ELAP accreditation applies only to paint chip, wipe, and soil samples.

Anal Non-Responsive

Technical Manager: Non-Responsive

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) **508621**

p-1/2

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: BROCKTON READINESS CENTER
2. Job Location: BROCKTON MA
3. Job #:
4. Contact Person: Non-Responsive
5. Submitted by: 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: 8/30/10
☐ 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
☐ Ver: @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 CHEST) 19 (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	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
BRO-PB-01		8/11/10		10x10cm				X				X					Date/Time: Contact: By:
BRO-PB-02																	
BRO-PB-03																	
BRO-PB-04																	
BRO-PB-05																	Date/Time: Contact: By:
BRO-PB-06																	
BRO-PB-07																	
BRO-PB-08																	
BRO-PB-09																	Date/Time: Contact: By:
BRO-PB-10																	
BRO-PB-11																	
BRO-PB-12																	

LABORATORY STANDARD (CUSTODY)

1. Date/Time RCVD: 8/23/10 @ 1015 Via: Fedex By (P
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / /
4. Comments:

Non-Responsive

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) 508621 p.2/2

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: SAME
2. Job Location:
3. Job #:
4. Contact Person: Non-Responsive
5. Submitted by: 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 +
❑ 2 Day Date Due:
❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ Email: Non-Responsive @
❑ 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 (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)
❑ Pb Dust Wipe (wipe type) (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	CLIENT CONTACT (LABORATORY STAFF ONLY)
BRO -PB -13		5/19/10		10x10 cm				X				X					Date/Time: Contact: By:
BRO -PB -14																	
BRO -PB -15																	
BRO -PB -16																	
BRO -PB -17																	Date/Time: Contact: By:
BRO -PB -18																	
BRO -PB -19																	
BRO -ASB-01							X				X						
																	Date/Time: Contact: By:

Non-Responsive

LABORATORY USE ONLY (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sig
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

Appendix C
Photo Documentation

Brockton RC

Drill Hall

Front Entry

Storage Area

Damaged TSI

Brockton RC

Kitchen

Water Intrusion on Drop Ceiling

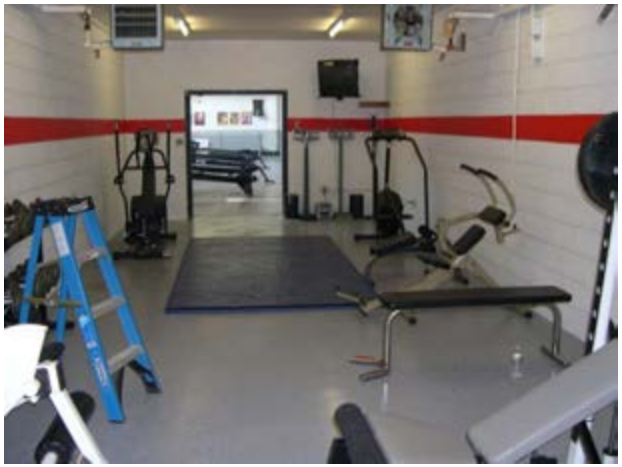
Mess Hall

Boiler Room

Brockton RC

Boiler Room

Water Intrusion on Drop Ceiling



Workout Area, Former Firing Range

Storage Area

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	**Brockton**	IAQ							Light		
Date	8/19/2010	Inspector	Non-Responsive	Instrument		TSI Q-Trak Plus Model 8554					Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		8554-02041015					Serial Number		K070277
Weather Conditions				Last Calibration		Mar-10					Last Calibration		30-Jul-10
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Value (fc)
1	Office			75.6		66.6		608		0.6		50.6		50
2	Office			75.4		66.1		656		0.6		62.3		50
3	Office			75.4		65.4		693		0.3		56.8		50
4	Commader's Office			75.4		65.2		656		0.1		67.7		50
5	1st SGT. Office			75.2		63.3		675		0.1		110.6		50
6	Admin Office			74.5		59.4		738		0.1		81.0		50
7	Office			75.2		63.3		622		0.1		88.9		50
8	Office			75.6		63.6		480		0.0		200.3		50
9	Office			75.6		63.3		484		0.0		135.7		50
10	Conference Room			75.9		62.1		493		0.1		108.6		50
11	Office			75.9		61.8		496		0.1		112.6		50
12	Office			76.6		61.3		506		0.1		72.5		50
13	Women's Room			76.1		64.0		536		0.2		170.4		5
14	Locker Room			76.1		64.2		564		0.0		145.7		7
15	Storage			76.1		61.8		522		0.0		57.3		30
16	Office			76.5		57.2		586		0.2		93.5		50
17	Office			77.0		57.3		698		0.1		81.6		50
18	Hall			77.4		57.5		499		0.4		28.5		5

Notes:

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°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

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	**Brockton**	IAQ								Light		
Date	8/19/2010	Inspector	Non-Responsive	Instrument		TSI Q-Trak Plus Model 8554						Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		8554-02041015						Serial Number		K070277
Weather Conditions				Last Calibration		Mar-10						Last Calibration		30-Jul-10
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Value (fc)
19	Copy Room			77.5		58.5		490		0.0		25.8	X	30
20	Lobby			78.1		57.0		441		0.2		87.0		10
21	Office			78.3		56.5		414		0.2		75.1		50
22	Kitchen			78.3		56.8		384		0.5		104.4		50
23	Mess Hall			78.3		56.9		390		0.2		140.3		10
24	Office			78.3		57.5		407		0.3		56.0		50
25	Boiler Room			78.6		57.1		410		0.3		47.7		30
26	Hall			78.4		56.9		396		0.4		140.9		5
27	Men's Room			78.6	X	62.5	X	842		0.6		108.1		5
28	Supply Room			79.2	X	59.4	X	675		0.3		23.8		10
29	Weight Room			79.5	X	60.1	X	767		0.6		29.6	X	30
30	Storage			79.3		59.3		525		0.5		23.8		10
31	Storage			78.4		57.6		973		0.5		24.3		10
32	Storage			78.4		56.8		423		0.6		22.6		10
33	Storage			78.3		57.8		378		0.6		14.4		10
34	Drill Hall			77.4		60.2		418		0.3		120.2		30

Notes:

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°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

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
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
98 MONTAUK ROAD
BROCKTON, MA 02301

July 1, 2013
PN: 39743799

Non-Responsive

Director, Industrial Hygiene Services

Non-Responsive

Project Manager

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Section **Page**

APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
98 MONTAUK RD, BROCKTON, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in several locations tested.	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, arm rests and keyboards. Several wheeled chairs with four casters were noted.	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		
Three of the 10 lead wipe samples indicated elevated lead levels.	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
Emergency Exits		
Emergency exit signs were not visible from all areas of the facility or illuminated.	Emergency exits should be properly illuminated (29 CFR 1910.37 (q)(6)).	RAC 3
Emergency Action Plans		
Emergency evacuation plans were not posted throughout the RC.	Facilities must have emergency action plans including emergency escape procedures and route assignments (29 CFR 1910.38 (a)(2)(i)).	RAC 3
Handrails		
Stairs along the south side of the former indoor firing range were not equipped with a handrail.	Every flight of stairs having four or more risers shall be equipped with standard stair railings (29 CFR 1910.23 (d)(1)).	RAC 3

Findings	Recommendations	Risk Assessment Code (RAC)
Housekeeping		
Storage areas in the Readiness Center were cluttered and an exit door in the supply room was blocked.	All places of employment, passageways, storerooms and service rooms shall be kept clean and orderly and in a sanitary condition (29 CFR 1910.22 (a)(1)).	RAC 3
Asbestos		
Asbestos-containing pipe insulation and presumed asbestos-containing floor tile and mastic were observed throughout the facility; an Asbestos Operation and Maintenance Program was not available on-Site.	Develop a site-specific asbestos operations and maintenance program for management of asbestos-containing materials in place as required by OSHA 29 CFR 1910.1001(j)(2).	RAC 3
PPE		
Hazard assessments have not been conducted to determine whether personal protective equipment is 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 4
Water Intrusion		
Water staining was observed on ceiling tiles in the admin area west of the lobby.	The source of the water intrusion should be identified and repaired. The water-stained materials should be repaired or replaced (ACGIH – Guidelines for the Assessment of Bio-aerosols in the Indoor Environment).	RAC 4
Fire Extinguishers		
No evidence was found that all fire extinguishers were being inspected on a monthly basis and service annually.	All fire extinguishers must be inspected on a monthly basis to determine that they are full and readily accessible (OSHA 29 CFR 1910.157(e)(2)).	RAC 3
Hazard Communication		
Oil and chemicals were improperly stored in the Assembly Hall.	Each container of hazardous chemicals in the work place must be labeled with the identity of the chemical and appropriate hazard warnings (29 CFR 1910.1200).	RAC 3

Findings	Recommendations	Risk Assessment Code (RAC)
Walking Surfaces		
Duct tape was used to secure tears in carpet and carpet at thresholds.	Flooring should be maintained in good repair to minimize uneven and slippery surfaces and tripping hazards (29 CFR 1910.22(b)(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 Readiness Center in Brockton, Massachusetts.

URS representative, Ms. Non-Responsive, conducted the Industrial Hygiene Survey on April 15, 2013. 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 mapping.

The Brockton Readiness Center is a two-story brick building, consisting of offices, a classroom, supply areas, gender separate bathrooms, storage rooms, a kitchen, an Assembly Hall and a former Indoor Firing Range. A layout of the Readiness Center is provided in Appendix A.

GENERAL: Emergency exit signs were not posted and illuminated throughout the facility. Emergency escape plans were not posted throughout the facility. Several fire extinguishers without inspection tags were identified in the first floor storage rooms. One fire extinguisher in the Assembly Hall was blocked. Ceiling tiles in the second floor classroom were damaged and falling.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in seven of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress work areas must be lighted by at least the minimum light intensities.

LEAD: Three of ten wipe samples collected in the Readiness Center were found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

On the day of the survey, the one paint chip sample was found to contain a level of lead below the HUD criteria for determination of paint as lead-based.

ASBESTOS: Asbestos-containing pipe insulation was identified during this survey. Presumed asbestos-containing floor tiles were noted to be damaged and pulling up at entrances in the Assembly Hall. No Asbestos Operations and Maintenance Program was found on site. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. 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 chairs armrests, keyboards, and monitors were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker. Wheeled chairs with four casters were identified throughout the admin areas.

NOISE: Noise monitoring and mapping levels in the Readiness Center determined that noise levels were below the OSHA permissible exposure limit (PEL) and Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and for conducting administrative functions. The building includes offices, a classroom, supply areas, gender separate bathrooms, storage rooms, a kitchen, an Assembly Hall and a former Indoor Firing Range.

The Readiness Center was found to be cluttered and unorganized at the time of URS' site visit.

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 Readiness Center. Interior carbon dioxide concentrations were found to be between 534 and 627 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (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 but is typically 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 419 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below

1,119 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 Readiness Center was measured between 0.0 ppm and 0.7 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-Trak 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.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 26%, which was within the guideline of less than 65% recommended by ASHRAE.

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.

The average temperature inside the Readiness Center was, 73.9 °F, which was within the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Readiness Center 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 in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
Supply Office, desk- Non-Responsive	Admin	**39.3**	50
Supply Office, computer workstations	Admin	**34.1**	50
Supply Office, computer work stations	Admin	**24.0**	50
PT Room, mats	Break Room	15.1	10
Admin east of Lobby, desk towards Drill Hall	Admin	68.1	50
Admin east of Lobby, side desk	Admin	62.6	50
Admin east of Lobby, desk- Non-Responsive	Admin	73.4	50
Admin east of Lobby, desk towards window	Admin	95.7	50
Admin west of Lobby, desk- Non-Responsive	Admin	**38.7**	50
Admin west of Lobby, desk- Non-Responsive	Admin	64.1	50
Admin west of Lobby, desk at front	Admin	**32.5**	50
Redleg Hockey and Logistics, desk- Non-Responsive	Admin	52.7	50
Redleg Hockey and Logistics, desk towards window	Admin	74.7	50
Battalion Commander Offices, desk- Non-Responsive	Admin	116.2	50
Battalion Commander Offices, desk-Commander	Admin	135.7	50
Battalion Commander Offices, desk-Stg. Major	Admin	85.5	50
Battalion Commander Offices, desk-XO	Admin	50.0	50
Commander Office, desk	Admin	59.2	50
1st Sergeant Office, desk	Admin	54.7	50

Location	Function	Measured Illuminance in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
Commander/ 1st Sergeant Office, computer table	Admin	**30.2**	50
Headquarters Battery Office, desk-front	Admin	**35.0**	50
Headquarters Battery Office, desk-[redacted]	Admin	81.5	50
Headquarters Battery Office, desk-[redacted]	Admin	64.3	50
Classroom, table	Admin	177.4	50
Classroom, table	Admin	176.7	50
Hallway	Hall	50.2	5

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in seven of the locations throughout the facility.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center 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 Readiness Center

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Foot ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Foot ($\mu g/ft^2$)
Break Room/ Kitchen, top of microwave, adjacent to window	Brockton RC Wipe-01	0.108	<110	200
Classroom, window sill in cardio area	Brockton RC Wipe-02	0.108	<110	200

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Foot ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Foot ($\mu g/ft^2$)
Admin east of Lobby, under TV, adjacent to window	Brockton RC Wipe-03	0.108	140	200
Headquarters Battery Office, floor under desk adjacent to hallway door	Brockton RC Wipe-04	0.108	<110	200
Battalion Commander Office, top of shelving unit next to printer	Brockton RC Wipe-05	0.108	<110	200
Former Indoor Firing Range, next to wall outlet	Brockton RC Wipe-06	0.108	**1600**	200
Former Indoor Firing Range, behind door, adjacent to storage	Brockton RC Wipe-07	0.108	**570**	200
Drill Hall, under sculpture, by Battery E area	Brockton RC Wipe-08	0.108	<110	200
Supply Room, under window, adjacent to loading area	Brockton RC Wipe-09	0.108	**2000**	200
Supply Room, oh shelf next to loading dock	Brockton RC Wipe-10	0.108	170	200

Three of the ten surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

One paint chip sample was collected from an area of peeling paint in the storage area and was analyzed for lead content. The analytical report from AMA is contained in Appendix C.

According to the U.S. Department of Housing and Urban Development (HUD), paint is considered to be lead-based if the quantity of lead is greater than 0.5% by weight. OSHA has not established a minimum percentage of lead to be defined as lead-based paint, therefore paint with lead in any amount above the analytical detection limit is

considered to be lead-based under these regulations. The results of URS' lead paint testing are contained in Table 2-3.

Table 2-3
Lead Content in Painted Surfaces

Paint Location	Lead Concentration (Percent Weight)	HUD Lead-Based Quantity (Percent Weight)
Red paint, floor, in front of loading area in Storage Area	0.26	0.5

On the day of the survey, the paint chip sample was not found to have a lead content below the HUD criteria for determination of paint as lead-based.

2.2.7 Asbestos

URS collected a total of three samples from damaged suspect friable asbestos-containing material (ACM) 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 with dispersion staining (EPA-600/M4-82-020). Table 2-4 below shows the results of the asbestos sampling.

Table 2-4
Asbestos Bulk Sample Results – Assembly Hall

Sample Location	Sample Description	URS Sample Number	Result Total Asbestos
Assembly Hall, west perimeter	Pipe Insulation	Brockton RC PLM-01A-01C	30% Chrysotile

The EPA states that any material with an asbestos content greater than 1% must be treated as ACM (EPA, Title 40 CFR Part 763.87 (c)(2)). The analytical report from AMA is contained in Appendix C.

Presumed asbestos-containing floor tiles and associated mastic were also identified during this survey. Until suspect materials have been sampled and determined not to

contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

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, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Personal noise dosimetry was conducted within the administrative office area. Noise exposures were measured using a data-logging Spark 703+ Noise Dosimeter. Personal noise dosimetry results indicated that, on the day of the survey, workers were not exposed to noise levels above the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 dBA/8-hour day. Table 2-5 indicates the individual monitored, the tasks performed and noise exposures.

Table 2-5
Noise Dosimetry Data

Location	Task	Sample Duration in Minutes	Monitoring Result TWA (dBA)*	Hearing Protection
Non-Responsive	Administrative	370	68.7	N/A

* The calculated 8-hour, time-weighted average (TWA) noise exposure in dBA. The OSHA PEL for noise exposure is 90 dBA. DoDI has established an employee exposure level of 85 dBA for requirement of a hearing conservation program.

In addition, noise mapping was conducted throughout the Readiness Center. Area noise mapping results indicated that, on the day of the survey, noise levels throughout the Readiness Center ranged from 50.4 decibels to 62.5 decibels. All noise mapping results were below the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 dBA/8-hour day.

2.5 Personal Protective Equipment

Personal protective equipment was orderly and readily available to employees in the Readiness Center. Personal protective equipment included safety glasses, ear plugs and nitrile gloves.

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. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise dosimetry results, noise mapping and a review of normal site operations, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was identified on site. No operations were observed by URS that would require the use of respiratory protection. If workers are allowed access to the former firing range, a hazard assessment should be conducted to determine whether respiratory protection and other forms of PPE should be required when entering this area.

3.4 Hazard Communication

A site-specific hazard communication program was identified on site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A written personal protective equipment program was identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site.

3.7 Safety

The former Indoor Firing Range was taken out of service approximately 15 years ago and is actively being used for storage. Presumed asbestos-containing floor tiles were noted to be damaged. Asbestos-containing pipe insulation was identified in the Assembly Hall. Wheeled chairs with four casters were identified throughout the administrative areas. Emergency exit signs were not posted and illuminated throughout the facility. Emergency escape plans were not posted throughout the facility. Several fire extinguishers without inspection tags were identified on the first floor storage rooms. Two fuel containers were being stored in the Assembly Hall. An exit in the supply room was blocked. No handrail was in place at stairs along the south of former Indoor Firing Range.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

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, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15

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

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

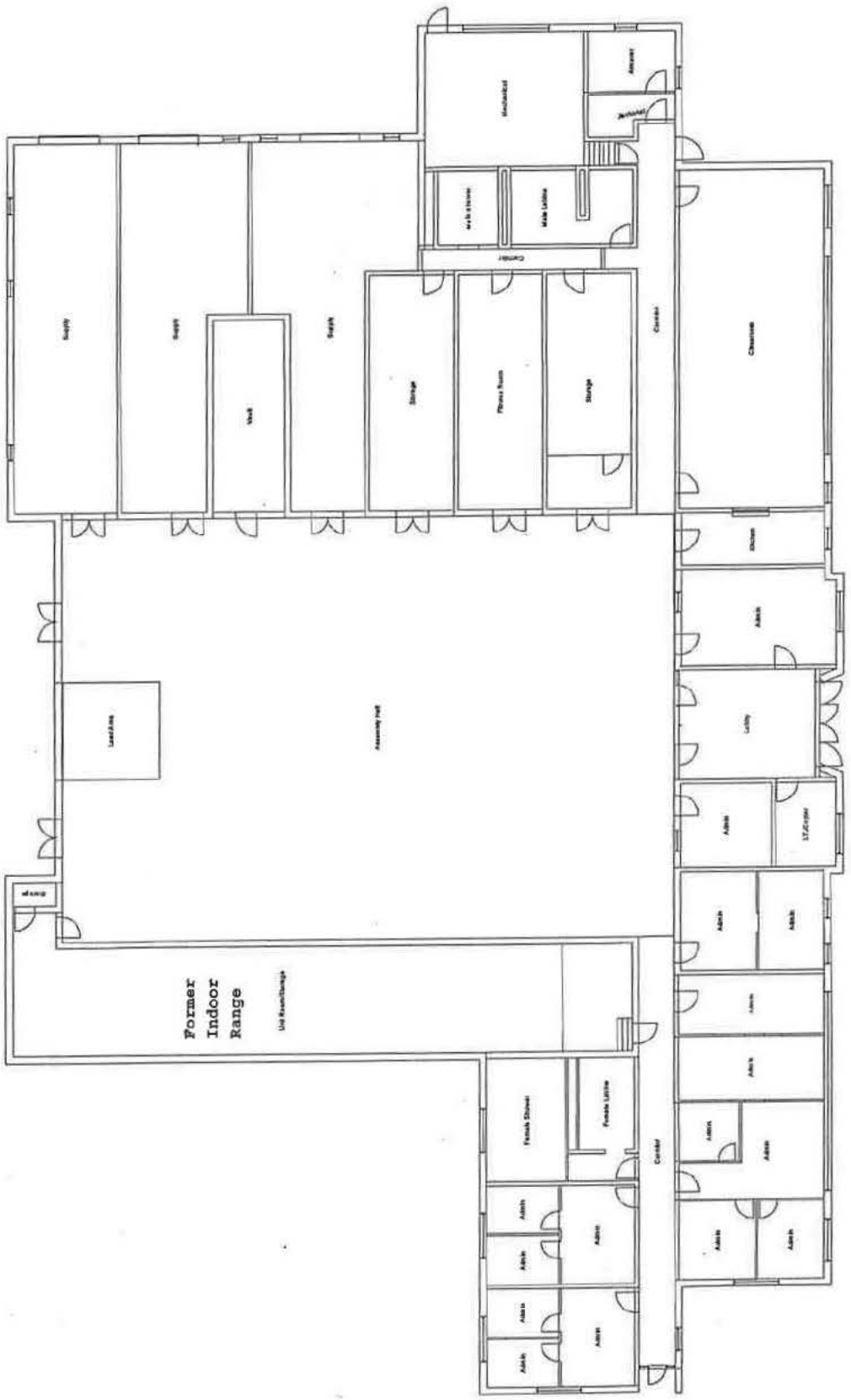
OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

APPENDIX A

SHOP DRAWING

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE

FMS BROCKTON - 25A55
Armory Floor Plan



APPENDIX B

PERSONNEL LIST

1-101 Field Artillery Regiment
Full-Time Manning Roster

Name	Rank	AGR Position	MTOE Position	Armory	Armory Address	Armory Phone	Armory Fax	Home Address	Home Phone	Blackberry	Mobile	Duty Hours
[redacted]	MAJ	AO	103/01	Brockton	[redacted]							0700-1500
	CPT	TO	103/02	Brockton								0700-1500
	SFC	PSNCO	105/02	Brockton								0700-1500
	SSG	HR NCO	105/03	Brockton								0700-1500
	CW2	HR TECH	N/A	Brockton								0800-1600
	MSG	OPS NCO	103/05	Brockton								0630-1430
	SSG	AFATDS NCO	104/03	Brockton								0700-1500
	SGT	LOG NCO	106/03	Brockton								0800-1600
	SFC	RNCO	103/06	Brockton								0700-1500
	SGT	TNCO		Brockton								0700-1500
	SSG	SNCO	111/01	Brockton								0700-1500
	SFC	RNCO	803-02	Quincy								0800-1600
	SGT	RADAR Tech		Rehoboth								0800-1600

Non-Responsive

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4/15/2013

APPENDIX C

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515722
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	98 Montauic Road, Brockton, MA	**Date Analyzed:**	5/6/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Brockton RC	**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
13058021	BrocktonRC PLM-01A	30	30	--	--	--	40	--	--	--	--	30	PI	Off-White	Homogeneous	SW	
13058022	BrocktonRC PLM-01B	30	30	--	--	--	40	--	--	--	--	30	PI	Off-White	Homogeneous	SW	
13058023	BrocktonRC PLM-01C	30	30	--	--	--	40	--	--	--	--	30	PI	Off-White	Homogeneous	SW	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515722
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	98 Montauic Road, Brockton, MA	**Date Analyzed:**	5/6/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Brockton RC	**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 Director Non-Responsive **Analyst(s)** Non-Responsive

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page 1/2

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: MA ARNG
2. Job Location: 98 Montauk Road, Brockton, MA
3. Job #: Brockton RC PO #: W912K6-09-A-0003
4. Contact Pe[redacted]
5. Submitted [redacted]

Reporting Information (Results will be provid[redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS			REPORT TO:
☐ Immediate Date Due: ____	☐ Immediate	☐ 3 Day	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Inclu[redacted] with Report
☐ 24 Hours Time Due: ____	☐ Next Day	☒ 5 Day +		☒ Email [redacted] urs.com
Comments: ____	☐ 2 Day	Date Due: 5/6/13		☐ Fax: [redacted]@us.army.mil
				☐ Verbal [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 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 1 (QTY)
- ☒ Pb Dust Wipe (wipe type Ghost) 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)

SAMPLE INFORMATION / **ANALYSIS** / **MATRIX**

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Brockton RC Wipe-01	Barun	4/15/13		100 cm²				X				X				
Brockton RC Wipe-02								X				X				
Brockton RC Wipe-03								X				X				
Brockton RC Wipe-04								X				X				
Brockton RC Wipe-05								X				X				
Brockton RC Wipe-06	maintenance							X				X				
Brockton RC Wipe-07								X				X				
Brockton RC Wipe-08								X				X				
Brockton RC Wipe-09								X				X				
Brockton RC Wipe-10								X				X				
Brockton RC Wipe-FB	field blank			—				X				X				
Brockton RC LBP-01	red paint							X			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: 4/29/13 @ 0900 Via: FED[redacted]
2. Date/Time Analyze[redacted] 5/6/13 @ ____ By (Print): [redacted]
3. Results Reported T[redacted] BEST AVAILABLE [redacted] Date: ____ Time: ____ Initials: ____
4. Comments: 7940 6954 8872

S15728

Page 2/2

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: MA IARNG
2. Job Location: 98 Montauk Road, Brockton, MA
3. Job #: Brockton RC
4. Contact Per: Non-Responsive
5. Submitted f: Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible): e-phone Non-Responsive

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Include COC/Field Data Sheet with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	☐ Email: Non-Responsive urs.com
Comments:	☐ 2 Day Date Due:	☐ Fax: us.army.mil
	☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	☐ 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 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 ℃)

Metal Analysis
- ☒ Pb Paint Chip 7 (QTY)
- ☒ Pb Dust Wipe (wipe type Ghost) 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	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	MATRIX: BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
Brockton RC PLM-01A	Pipe Insulation Others	4/15/13					X				X						Date/Time: Contact: By:
Brockton RC PLM-01B							X				X						
Brockton RC PLM-01C							X				X						
																	Date/Time: Contact: By:
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

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:**	MA ARNG	**Chain Of Custody:**	515722
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	98 Montauk Road, Brockton, MA	**Date Submitted:**	4/29/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Brockton RC	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/6/2013 **Report Date:** 5/6/2013

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
13058009	BrocktonRC Wipe-01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13058010	BrocktonRC Wipe-02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13058011	BrocktonRC Wipe-03	Flame	Wipe	****	0.108	110	ug/ft^2	15	140	ug/ft^2	
13058012	BrocktonRC Wipe-04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13058013	BrocktonRC Wipe-05	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13058014	BrocktonRC Wipe-06	Flame	Wipe	****	0.108	110	ug/ft^2	170	1600	ug/ft^2	
13058015	BrocktonRC Wipe-07	Flame	Wipe	****	0.108	110	ug/ft^2	61	570	ug/ft^2	
13058016	BrocktonRC Wipe-08	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13058017	BrocktonRC Wipe-09	Flame	Wipe	****	0.108	110	ug/ft^2	210	2000	ug/ft^2	
13058018	BrocktonRC Wipe-10	Flame	Wipe	****	0.108	110	ug/ft^2	18	170	ug/ft^2	
13058019	BrocktonRC Wipe-FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

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CERTIFICATE OF ANALYSIS

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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:**	MA ARNG	**Chain Of Custody:**	515722		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	98 Montauk Road, Brockton, MA	**Date Submitted:**	4/29/2013		
	Havre de Grace, Maryland 21078	**Job Number:**	Brockton RC	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/6/2013	**Report Date:**	5/6/2013

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
13058020	BrocktonRC LBP-01	Flame	Paint Chip	****	N/A	0.0079	%Pb		0.26	%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

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.

Analy Non-Responsive

Technical Manager Non-Responsive

Cell (410) 247-2024

159201 515722

(Please Refer To This Number For Inquires)

page 1/2

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

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: MA JARNG
2. Job Location: 98 MONTAUK Road, Brockton, MA
3. Job #: BROCKTON BC 0003
4. Contact Perso[redacted] Non-Responsive
5. Submitted by: [redacted] Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible): → phone: [redacted] Non-Responsive

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	[redacted] Non-Responsive
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	[redacted] us.com
Comments:	☐ 2 Day Date Due: 5/6/13	☐ Fax: [redacted] us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ Ver[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 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 1 (QTY)
- ☒ Pb Dust Wipe (wipe type GHOST) 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: WIPE AND OTHER	SPORE TRAP	TAPE	SWAB
BROCKTON BC Wipe-01	PORCH	4/15/13		100cm²				X				X				
BROCKTON BC Wipe-02								X				X				
BROCKTON BC Wipe-03								X				X				
BROCKTON BC Wipe-04								X				X				
BROCKTON BC Wipe-05								X				X				
BROCKTON BC Wipe-06	MAINTENANCE							X				X				
BROCKTON BC Wipe-07								X				X				
BROCKTON BC Wipe-08								X				X				
BROCKTON BC Wipe-09								X				X				
BROCKTON BC Wipe-10								X				X				
BROCKTON BC Wipe-FB	FIELD BLANK			—				X				X				
Brockton BC LBP-01	red paint							X			X					

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time:	Contact:	By:
Date/Time:	Contact:	By:
Date/Time:	Contact:	By:

[redacted] Non-Responsive

LABORATORY STAFF ONLY:

1. Date/Time RCVD: 4/29/13 @0900 Via: FEDEX By (Print): [redacted] Non-Responsive Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Date: / / Time: AM/PM
4. Comments: 7940 6954 8872

(CUSTODY)

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OWI (410) 247-2024

159202 210 REV. 6.08

S15722

page 2/2

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: MA ARNG
2. Job Location: 98 Montauk Road, Brockton, MA
3. Job #: Brockton RC [redacted]
4. Contact Per[redacted]
5. Submitted B[redacted]

Reporting Information (Results will be provide[redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS			REPORT TO:
☐ Immediate Date Due: ____	☐ Immediate	☐ 3 Day	☐ Results Required By Noon	☒ Inc[redacted]ith Report
☐ 24 Hours Time Due: ____	☐ Next Day	☒ 5 Day +	(Every Attempt Will Be	☒ [redacted] urs.com
Comments: ____	☐ 2 Day	Date Due: ____	Made to Accomodate)	☐ 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 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 7 (QTY)
- ☒ Pb Dust Wipe (wipe type ghost) 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)

SAMPLE INFORMATION / **ANALYSIS** / **MATRIX**

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Brockton RC PLM-01A	Pipe Insulation Debris	4/15/13					X				X					
Brockton RC PLM-01B	|	|					X				X					
Brockton RC PLM-01C	|	|					X				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: ____ / ____ / ____ @ ____ Via: ____ By (Print): ____ Sign: ____
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ Date: ____ / ____ / ____ Initials: ____
4. Comments: ____

APPENDIX D

PHOTOGRAPHIC LOG

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Brockton RC	98 Montauk Rd., Brockton, MA	39743799

Photo No.	Date:
1	4/15/13

Description:

Damaged asbestos-containing pipe insulation along west perimeter of Assembly Hall.

Photo No.	Date:
2	4/15/13

Description:

Entrance with no entry mat and improperly stored fuel containers in the Assembly Hall.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Brockton RC	98 Montauk Rd., Brockton, MA	39743799

Photo No.	Date:
3	4/15/13

Description:

Stairs with no handrails at south entrance to the former Indoor Firing Range.

Photo No.	Date:
4	4/15/13

Description:

Water staining on ceiling tiles in admin west of lobby.

P:\Project\National Guard Bureau\39743798 IH Services ME & MA\39743799 - MA Sites\Reports\Brockton RC\Brockton RC Photo Log.docx

APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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

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.

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
CAMBRIDGE READINESS CENTER
450 CONCORD AVENUE
CAMBRIDGE, MASSACHUSETTS

April 2006
PN: 39741508

Non-Responsive

Office Manager

Non-Responsive

Project Manager

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APPENDICES

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 over half of all 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
Lead		
Lead was detected in wipe samples collected from the 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 where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
Damaged and missing floor tile was present throughout the facility. Exposed pipefittings were found in various locations.	Repair or remove asbestos-containing floor tile and pipefittings. 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 was available.	Implement the site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
No site specific hazard communication plan available.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200 (e))	RAC 4
Emergency Exit Route Safety		
An emergency exit was obstructed by equipment being stored in the hallway.	Exit routes must be free and unobstructed. No materials or equipment may be placed, either permanently or temporarily, within the exit route (OSHA 29 CFR 1910.37 (a)(3)).	RAC 4
Mold		
Evidence of water incursions throughout building that may promoter growth of mold.	Repair leaks in roof and institute a moisture management plan to inform employees of best practice in handling 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 Readiness Center located at 450 Concord Avenue in Cambridge, Massachusetts 02138. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On January 27, 2004, Mr. Non-Responsive an industrial hygienist with URS, conducted a site visit to the Readiness Center in Cambridge, Massachusetts. 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. Mr Non-Responsive of the State of Massachusetts was Mr. Non-Responsive site contact for this survey.

A drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

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. Computer workstation chairs and armrests were in a fixed position and keyboards could not be adjusted in offices #10 (Photo # 3312), #13 (Photo # 3314) and #14 (Photo # 3315). 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.

Water marks were observed on the ceiling in office # 22 (Photo # 3319) and room # 1 (Photo # 3322) that may indicate possible mold growth.

2.2 CHEMICAL AND PHYSICAL AGENTS SAMPLED

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 12.6 – 14.4% with an average of 13.7%. 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).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 402 to 666 parts per million (ppm), with an average of 413 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 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 background level. Given a background level of 350 ppm on the day of the survey, the ASHRAE limit would be 1050 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide levels were also measured in the Readiness Center. Carbon monoxide concentrations remained at 0 parts per million (ppm) throughout the survey period. 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 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. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

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 Illuminance (foot candles)	Recommended Minimum Illuminance (foot candles)
Office # 10	Administrative Duties	6	50
Office # 12	Administrative Duties	21	50
Office # 13	Administrative Duties	42	50
Office # 14	Administrative Duties	61	50
Office # 15	Administrative Duties	47	50
Office # 21	Administrative Duties	51	50
Office # 22	Administrative Duties	41	50
Office # 23	Administrative Duties	23	50
Office # 24	Administrative Duties	28	50
Office # 25- Window Blinds Closed	Administrative Duties	23	50
Office # 25-Window Blinds Opened	Administrative Duties	75	50
Office # 27	Administrative Duties	76	50
Office # 27A	Administrative Duties	61	50
Front Lobby # 18	Accessway	26	3
Hallway # 28	Accessway	8	3
Hallway # 35	Accessway	16	3

On the day of the survey the illuminance in the administrative area was inadequate in over half of the offices.

2.2.5 Lead

Paint chips were collected in two areas where paint was peeling and sent to AMA Analytical Services, Inc. for analysis. The two 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 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)
2nd PLT Room # 7	0127-LPC01	0.01	<0.01
Hall Stairway # 35	0127-LPC02	0.01	0.17

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 ($\mu g/ft^2$)
Admin Room #1 – Top of Locker	0127-LW11	1.000	94	200
Admin Room #7- Top of File Cabinet	0127-LW12	1.000	35	200
Admin Room #10 – Tope of File Cabinet	0127-LW13	0.938	66	200
Admin Room # 13 – Top of Supply Cabinet	0127-LW14	1.000	20	200
Admin Room #15 – Top of File Cabinet	0127-LW15	1.000	<12	200
Admin Room #22 – Floor	0127-LW16	1.000	<12	200
Admin Room #26 – Top of File Cabinet	0127-LW17	1.000	<12	200
Admin Room #27 – Window Sill	0127-LW18	0.556	99	200
Admin Room #25 – Desk	0127-LW19	1.000	<12	200
Admin Kitchen #34 – Table	0127-LW20	1.000	<12	200
Blank	0127-LWBlank	N/A	<12 µg	N/A

2.2.6 Asbestos

An exposed pipe fitting was discovered in bathroom # 6 during the walk through inspection (Photo # 3309). A puncture hole in a pipefitting was found in Bathroom # 16 exposing the asbestos insulation (Photo # 3316). Damaged ACM floor tile was found in the hall outside of bathroom #6 (Photo # 3311) and in the front lobby #18 (Photo # 3318).

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 mostly neat and orderly, accept in Hallway # 28. Hallway # 28 is used as an emergency exit route and a storage area. The exit route has chairs, easels, and some ladders blocking the path to the emergency door (Photo # 3320). The fire extinguisher in hallway # 40 was unmarked as to its location and was last inspected in October of 2000 (Photo # 3317).

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 illuminance in the administrative area was inadequate in over half the offices. URS recommends increasing lighting in the administrative areas through use of task lighting. While work is in progress the administrative area must be lighted by at least the minimum light intensities.

LEAD: The two surfaces tested in this area for lead were found to be within the allowable limits and require no further action at this time.

ASBESTOS: The floor tile and pipe fittings were determined to contain asbestos in a concentration greater than one percent during a previous survey conducted by ATC Associates, Incorporated.

MOLD: The water stains on the ceilings could lead to mold problems if not addressed.

3.0 FORMER FIRING RANGE

3.1 OPERATION DESCRIPTION

The 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 ($\mu g/ft^2$)
Firing Range-Top of Heating Unit	0127-LW06	1.000	7300	200
Firing Range-Top of a Locker	0127-LW07	1.000	180	200
Firing Range-Top of Light Guard	0127-LW08	0.833	480	200
Firing Range-Floor of Bullet Trap	0127-LW09	0.833	73	200
Firing Range-Floor-Center	0127-LW10	1.000	27	200
Blank	0127-LWBlank	N/A	<12 µg	N/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
Levels 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	0127-LA02	1028	<2.9	50.0
Blank	0127-LA03	N/A	<3.0 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 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.

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: Two surfaces within the former firing range were found to contain lead dust levels which exceed the maximum limit set by the National Guard Bureau Region North Industrial Hygiene Office (See Appendix G). URS recommends that an appropriately licensed lead contractor clean the former firing range. Guidelines for the cleanup and rehabilitation of indoor firring ranges are contained in Appendix H.

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 and storing equipment. 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 # 39-Floor	0127-LW01	1.000	18	200
Drill Hall # 39-Top of a Brown Storage Box	0127-LW02	1.000	<12	200
Drill Hall # 39-Top of a Storage Box	0127-LW03	1.000	22	200
Drill Hall # 39-Top of the Fruitopia Machine	0127-LW04	1.000	24	200
Drill Hall # 39-Top of Bleachers	0127-LW05	0.938	<13	200
Blank	0127-LWBlank	N/A	<12	200

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

Table 4-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Drill Hall	0127-LA01	1136	<2.6	50.0
Blank	0127-LA03	N/A	<3.0 µg	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 50.0 $\mu g/m^3$ 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 in the drill hall for lead were found to be within allowable limits and require no further action at this time.

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

One paint chip sample was collected 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 5-1 below shows the results of the lead paint testing.

Table 5-1
Level of Lead in Paint Found in the Boiler Room

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room #32	0127-LPC03	0.1	0.16

The analytical report from AMA is contained in Appendix D.

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 one surface tested in the boiler room area for lead was found to contain levels below the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. No further testing is required at this time.

ASBESTOS: An exposed pipe fitting was discovered during the inspection (Photo # 3354) which should be repaired by an appropriately licensed contractor.

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 likely 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 likely 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 likely not required for this site.

6.4 HAZARD COMMUNICATION

No safety program was found regarding hazard communication. An Operations and Maintenance (O & M) Plan was provided to URS before the inspection with regard to the asbestos on site. The main issues concerning this program were that the asbestos has not been labeled as containing asbestos and no training has been conducted. These are important parts of the O &M Plan.

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 likely not required for this site.

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

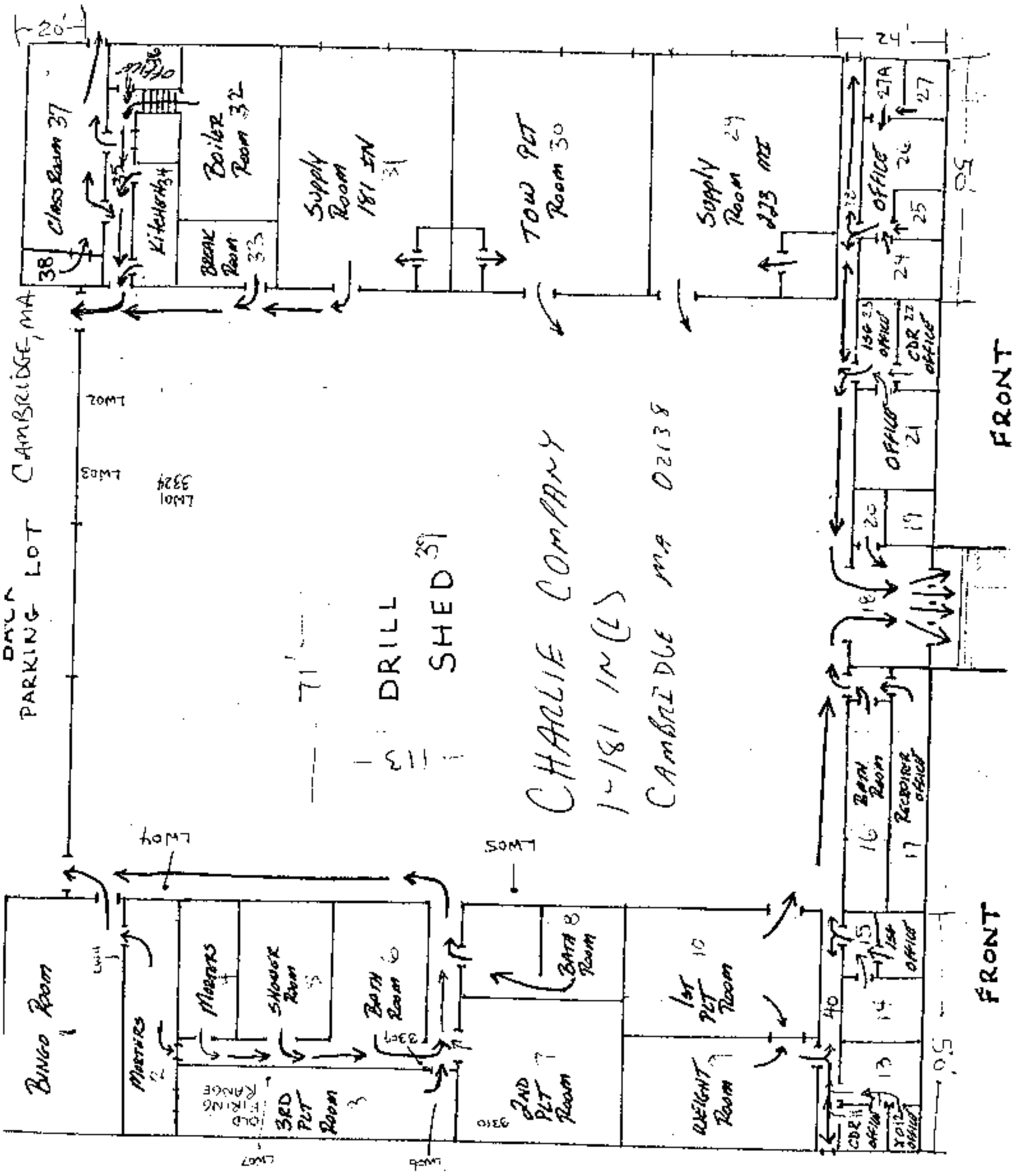
Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

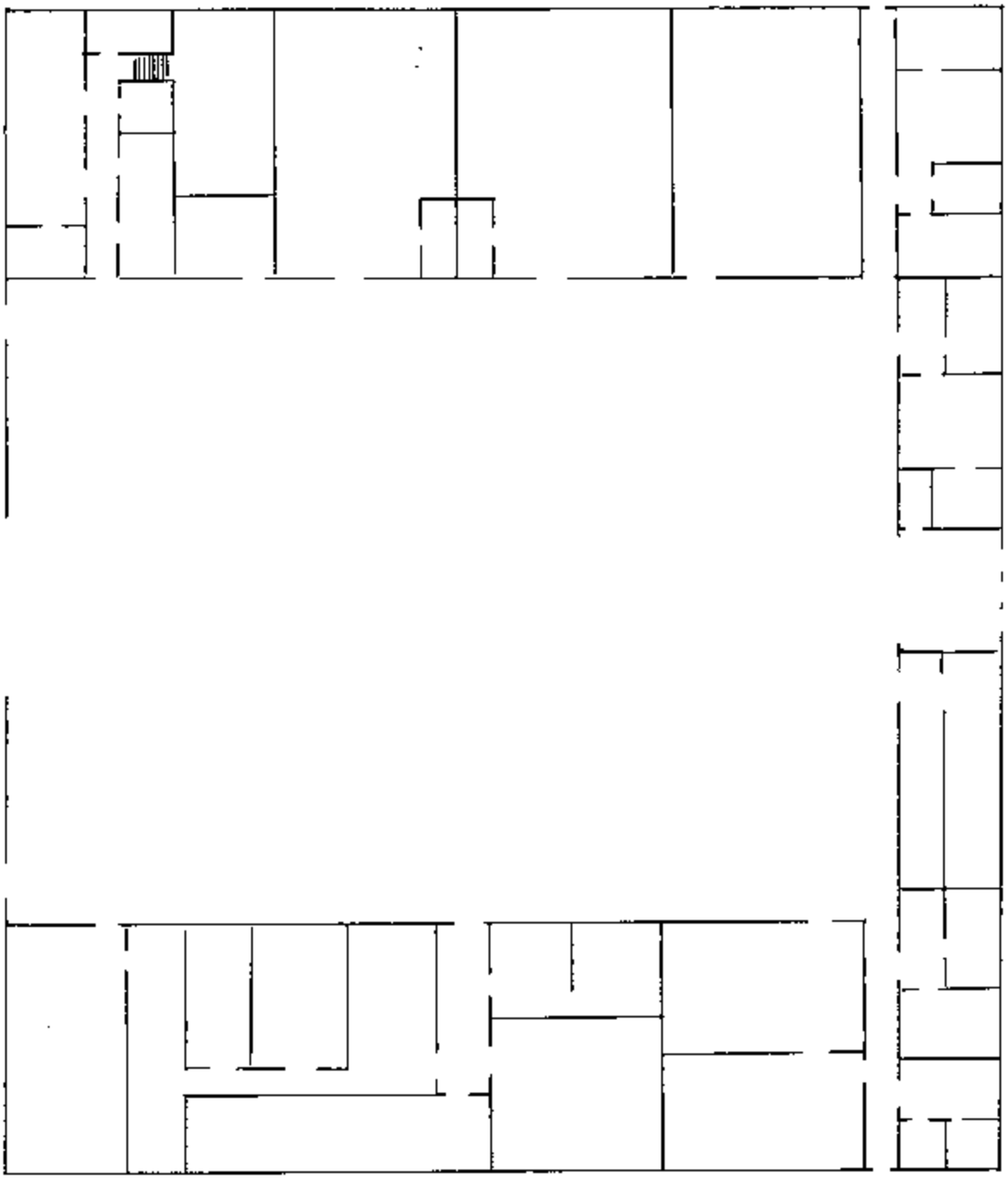
Standard for General Industry: 29 CFR 1910

APPENDIX A

READINESS CENTER DRAWING



CAMBRIDGE MA - ARMY NATIONAL GUARD - ARMORY SITE PLAN



APPENDIX B

PERSONNEL LIST

PERSONEL LIST
CAMBRIDGE ARMORY

	Rank
Non-Responsive	SFC
	SSG
	CIV
	SGT

BEST AVAILABLE COPY

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122702
Address:	301-III Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	450 Concord Ave. Cambridge, MA	**Date Analyzed:**	02/11/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	11-Feb-04
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
0423091	0127 LA 01	Flame	Air	1136	N/A	2.64	ug/m^3	<	2.6	ug/m^3	
0423092	0127 LA 02	Flame	Air	1028	N/A	2.92	ug/m^3	<	2.9	ug/m^3	
0423093	0127 LA 03	Flame	Air Blank	0	N/A	3.00	ug/m^3	<	3	ug	
0423094	0127 LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	<	0.01	%Pb	
0423095	0127 LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb		0.17	%Pb	
0423096	0127 LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb		0.16	%Pb	
0423097	0127 LW 01	Flame	Wipe	****	1.000	12.00	ug/ft^2		18	ug/ft^2	
0423098	0127 LW 02	Flame	Wipe	****	1.000	12.00	ug/ft^2	<	12	ug/ft^2	
0423099	0127 LW 03	Flame	Wipe	****	1.000	12.00	ug/ft^2		22	ug/ft^2	
0423100	0127 LW 04	Flame	Wipe	****	1.000	12.00	ug/ft^2		24	ug/ft^2	
0423101	0127 LW 05	Flame	Wipe	****	0.938	12.80	ug/ft^2	<	13	ug/ft^2	
0423102	0127 LW 06	Flame	Wipe	****	1.000	12.00	ug/ft^2		7300	ug/ft^2	
0423103	0127 LW 07	Flame	Wipe	****	1.000	12.00	ug/ft^2		180	ug/ft^2	
0423104	0127 LW 08	Flame	Wipe	****	0.833	14.40	ug/ft^2		480	ug/ft^2	
0423105	0127 LW 09	Flame	Wipe	****	0.833	14.40	ug/ft^2		73	ug/ft^2	
0423106	0127 LW 10	Flame	Wipe	****	1.000	12.00	ug/ft^2		27	ug/ft^2	
0423107	0127 LW BLANK	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Army National Guard	**Chain Of Custody:**	122702
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	450 Concord Ave. Cambridge, MA	**Date Analyzed:**	02/11/2004
	Havre de Grace, Maryland 21078	**Job Number:**	42056-012-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	11-Feb-04
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 results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analy[redacted] Non-Responsive

Technical Manager: [redacted]

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
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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:**	Armory	**Chain Of Custody:**	138226		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Cambridge, MA	**Date Submitted:**	5/20/2005		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**			
		P.O. Number:	Not Provided	**Date Analyzed:**	5/25/2005	**Report Date:**	25-May-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
0540443	0127-LW11	Flame	Wipe	****	1.000	12.00	ug/ft²	94	ug/ft²	
0540444	0127-LW12	Flame	Wipe	****	1.000	12.00	ug/ft²	35	ug/ft²	
0540445	0127-LW13	Flame	Wipe	****	0.938	12.80	ug/ft²	66	ug/ft²	
0540446	0127-LW14	Flame	Wipe	****	1.000	12.00	ug/ft²	20	ug/ft²	
0540447	0127-LW15	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0540448	0127-LW16	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0540449	0127-LW17	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0540450	0127-LW18	Flame	Wipe	****	0.556	21.60	ug/ft²	99	ug/ft²	
0540451	0127-LW19	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0540452	0127-LW20	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0540453	0127-LW Blank2	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	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]

APPENDIX E

TRAINING CERTIFICATES

NOT APPLICABLE

APPENDIX F

PHOTOGRAPHS

Photo 3309: Bathroom #6 – Damaged asbestos-containing pipe insulation

Photo 3311: Hall Outside Bathroom # 6 – Missing and damaged asbestos-containing floor tile

Photo 3312: 1st PLT Room – Ergonomically poor computer work station chair

Photo 3314: Office #13 – Computer work station

Photo 3315: Office #14 Computer work station

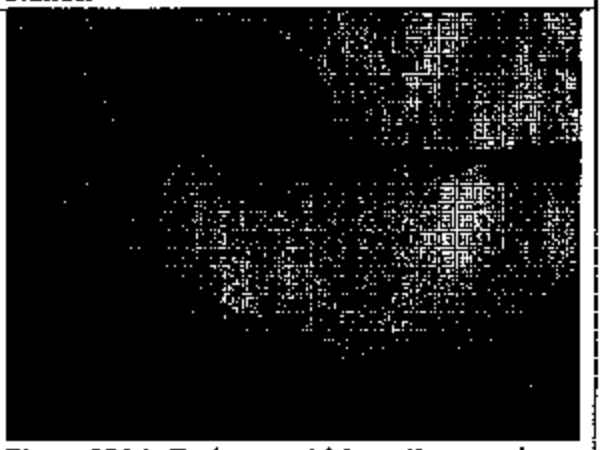


Photo 3316: Bathroom #16 - - Damaged asbestos-containing pipe insulation

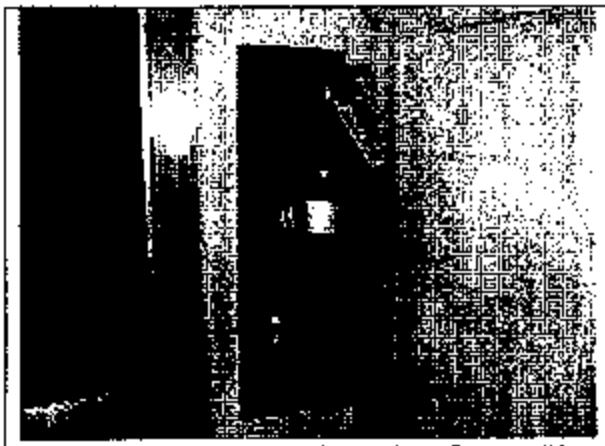


Photo 3317: Hall outside Weight Room #9 Fire extinguisher last inspected Oct. 2000

Photo 3319: CDR's Office #22 – Water stains on ceiling tiles

Photo 3320: Hall #28 – Blocked emergency egress

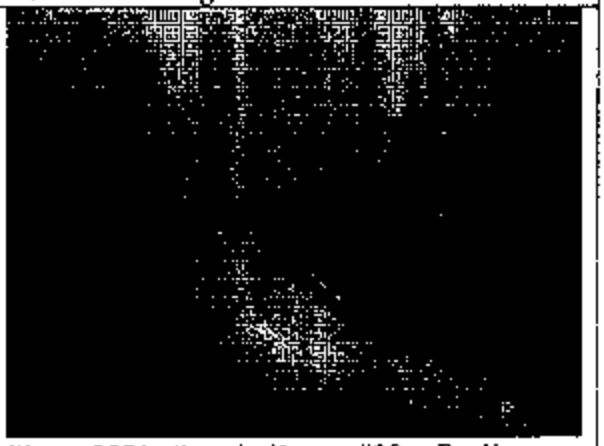


Photo 3321: Supply Room #29 - Peeling paint on ceiling

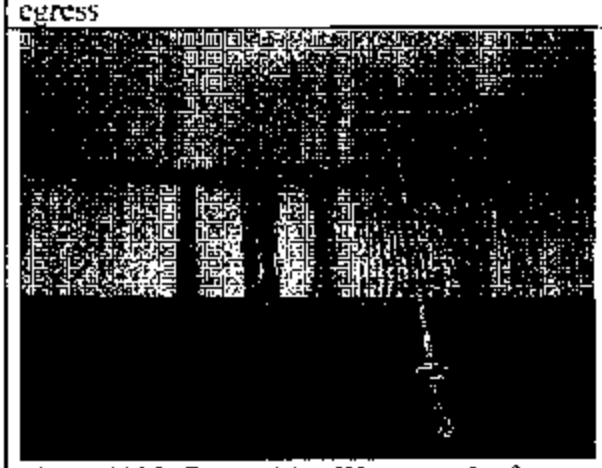


Photo 3322: Room #1 -- Water marks from roof leak

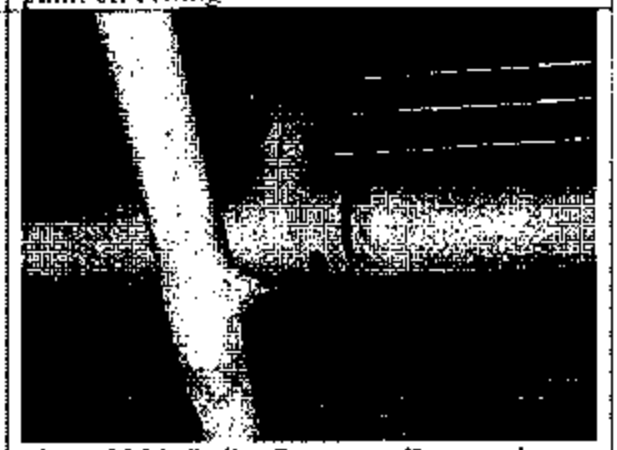


Photo 3354: Boiler Room - – Damaged asbestos-containing pipe insulation

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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.

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.

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)

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).

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) [illegible]

(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.

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

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.

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 identifted 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 notifted to determine the disposition of lead contaiing debris.

18. Conversion of Indoor Ranges

Prior to the start of decontamination, employers must ensure that all proceduros 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.

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

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.

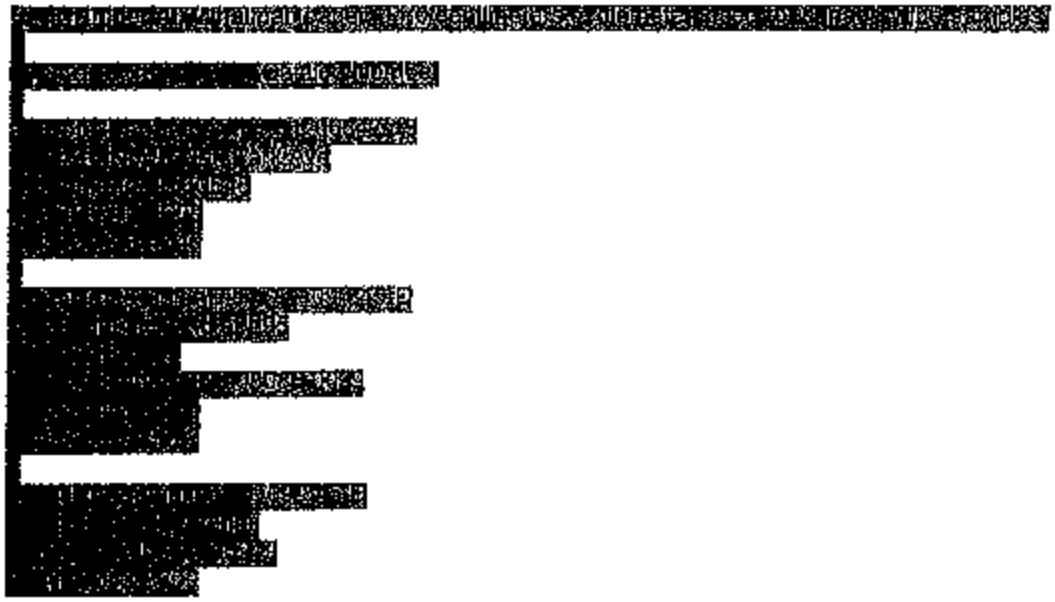
Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-33811M

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. 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

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:

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

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

ug – Microgram

Cm2 -- Centimeters squared

Sq ft - Square foot

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:

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:

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

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.

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
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
450 CONCORD AVENUE
CAMBRIDGE, MA 02138

July 11, 2013
PN: 39743799

Non-Responsive

Director, Industrial Hygiene Services

Non-Responsive

Project Manager

BEST AVAILABLE COPY

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Section **Page**

APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
450 CONCORD AVE., CAMBRIDGE, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in many locations tested.	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, arm rests 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		
Five of the 10 lead wipe samples indicated elevated lead levels.	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
Asbestos		
Presumed asbestos-containing floor tiles and associated mastic were observed throughout the facility; an Asbestos Operation and Maintenance Program was not available on-Site.	Develop a site-specific asbestos operations and maintenance program for management of asbestos-containing materials in place as required by OSHA 29 CFR 1910.1001(j)(2).	RAC 4
PPE		
Hazard assessments have not been conducted to determine whether personal protective equipment is 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 4
Housekeeping		
Storage areas were found to be somewhat unorganized at the time of URS' site visit.	All places of employment, passageways, storerooms and service rooms shall be kept clean and orderly and in a sanitary condition (29 CFR 1910.22 (a)(1)).	RAC 3

Findings	Recommendations	Risk Assessment Code (RAC)
Fire Extinguishers		
No evidence was found that all fire extinguishers were being inspected on a monthly basis.	All fire extinguishers must be inspected on a monthly basis to determine that they are full and readily accessible (OSHA 29 CFR 1910.157(e)(2)).	RAC 3
Flammable Storage		
Chemicals/ flammable materials were observed improperly stored throughout the facility.	Each container of hazardous chemicals in the work place must be labeled with the identity of the chemical and appropriate hazard warnings (29 CFR 1910.1200).	RAC 3
Stairways		
Exterior stairs did not have a standard railing.	Every flight of stairs having four or more risers shall be equipped with standard stair railings (29 CFR 1910.23 (d)(1)).	RAC 3
Ladders		
Ladders were improperly stored in the boiler room.	Ladders not in use shall be properly stored in a vertical position fastened to walls (29 CFR 1910.25 (c)(2)(i)).	RAC 4
Hazard Communication		
No site-specific hazard communication program had been developed for the site.	Employers shall develop, implement and maintain a written hazard communication program (29 CFR 1910.1200 (e)(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 Readiness Center in Cambridge, Massachusetts.

URS representative, Mr. Non-Responsive, conducted the Industrial Hygiene Survey on May 16, 2013. 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 mapping.

The Cambridge Readiness Center is a single-story brick building, consisting of offices, classrooms, a supply area, gender separate bathrooms, locker storage rooms, storage rooms, a kitchen, an Assembly Hall and a former Indoor Firing Range. A layout of the Readiness Center is provided in Appendix A.

GENERAL: The former Indoor Firing Range has not been decontaminated and is posted as unsafe due to lead contamination, it is not in use. No evidence was found that all fire extinguishers were being inspected on a monthly basis. The exterior stairs to the east admin hall does not have handrails. Chemical products were observed to be improperly stored in the Assembly Hall, kitchen and boiler room. Ladders were stored improperly in the north hall and boiler room.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in several of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress work areas must be lighted by at least the minimum light intensities.

LEAD: Five of ten wipe samples collected in the Readiness Center were found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

On the day of the survey, none of the paint chip samples were found to contain a level of lead above the HUD criteria for determination of paint as lead-based.

ASBESTOS: Presumed asbestos-containing floor tiles and associated mastic were identified during this survey, however no Asbestos Operations and Maintenance Program was found on site. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. 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, keyboards, and desks were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker.

NOISE: Area noise monitoring levels in the Readiness Center determined that noise levels were below the OSHA permissible exposure limit (PEL) and Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and conducting administrative functions. The building includes offices, classrooms, a supply area, gender separate bathrooms, locker storage rooms, storage rooms, a mess hall, a kitchen, an Assembly Hall and a former Indoor Firing Range.

The Readiness Center was found to be cluttered and unorganized at the time of URS' site visit.

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 Readiness Center. Interior carbon dioxide concentrations were found to be between 549 and 748 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (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 but is typically 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 398 ppm. Therefore, ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below

1,098 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 Readiness Center was measured to be 0.0 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-Trak 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.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 47.4%, which was within the guideline of less than 65% recommended by ASHRAE.

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.

The average temperature inside the Readiness Center was, 69.1 °F, which was within the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort.

2.2.5 Lighting

Lighting in the Readiness Center 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 Foot Candles (FC)	Recommended Minimum Illuminance Foot Candles (FC)
Classroom, front table	Admin	**43.8**	50
Classroom, back table	Admin	**33.7**	50
Kitchen, counter	Break Room	27.8	10
Left Supply, workstation	Admin	**20.9**	50
Learning Center, back table	Admin	**17.4**	50
Learning Center, window table	Admin	174.3	50
North Admin, window workstation	Admin	**49.0**	50
North Admin, workstation	Admin	**16.0**	50
Admin near Drill Hall, window office, desk	Admin	**14.8**	50
North Admin, left office, desk	Admin	**20.0**	50
Admin near Drill Hall, office, desk	Admin	**21.8**	50
East Admin, left desk	Admin	67.9	50
East Admin, right desk	Admin	68.7	50
Company Commander office, desk	Admin	**40.9**	50
East Admin, computer stations, table	Admin	**26.9**	50
Middle Supply, workstation	Admin	**22.8**	50
Right Supply, workstation	Admin	**30.0**	50

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in thirteen of the office/administrative locations tested.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center 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 Readiness Center

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Foot ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Foot ($\mu g/ft^2$)
East admin, top of mail boxes	Cambridge RC Wipe-01	0.108	<110	200
North admin, window sill	Cambridge RC Wipe-02	0.108	**620**	200
Classroom near boiler room, top of TV	Cambridge RC Wipe-03	0.108	<110	200
Learning center, top of heater board	Cambridge RC Wipe-04	0.108	<110	200
Admin off drill hall, window sill	Cambridge RC Wipe-05	0.108	**240**	200
Boiler Room, top of control box	Cambridge RC Wipe-06	0.108	**620**	200
Kitchen, blue shelf near toaster	Cambridge RC Wipe-07	0.108	<110	200
Locker/latrine, top of paper towel dispenser	Cambridge RC Wipe-08	0.108	<110	200
Drill hall, floor next to amnesty box	Cambridge RC Wipe-09	0.108	**4500**	200
Supply room, shelf labeled soldier uniforms	Cambridge RC Wipe-10	0.108	**320**	200

Five of the ten surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

Two paint chip samples were collected from areas of peeling paint within the facility and were analyzed for lead content. The analytical report from AMA is contained in Appendix C.

According to the U.S. Department of Housing and Urban Development (HUD), paint is considered to be lead-based if the quantity of lead is greater than 0.5% by weight. OSHA has not established a minimum percentage of lead to be defined as lead-based paint, therefore paint with lead in any amount above the analytical detection limit is considered to be lead-based under these regulations. The results of URS' lead paint testing are contained in Table 2-3.

Table 2-3
Lead Content in Painted Surfaces

Paint Location	Lead Concentration (Percent Weight)	HUD Lead-Based Quantity (Percent Weight)
Tan paint, walls, boiler room	0.11	0.5
Dark green paint, walls, entrance hall near boiler room door	0.13	0.5

On the day of the survey, neither of the paint chip samples was found to have a lead content above the HUD criteria for determination of paint as lead-based.

2.2.7 Asbestos

No damaged, friable suspect material was identified during this survey for sample collection.

Presumed asbestos-containing floor tiles and associated mastic were identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

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, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Area noise dosimetry was conducted within the administrative office area. Area exposures were measured using a data-logging Spark 703+ Noise Dosimeter. Area noise dosimetry results indicated that, on the day of the survey, workers were not exposed to noise levels above the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 decibels, A scale (dBA)/8-hour day. Table 2-4 indicates the individual monitored, the tasks performed and noise exposures.

Table 2-4
Noise Dosimetry Data

Location	Task	Sample Duration in Minutes	Monitoring Result TWA (dBA)*	Hearing Protection
NCO Office	Administrative	336	58.3	N/A

* The calculated 8-hour, time-weighted average (TWA) noise exposure in dBA. The OSHA PEL for noise exposure is 90 dBA. DoDI 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 Readiness Center. Personal protective equipment included safety glasses, ear plugs and nitrile gloves. No personal protective equipment was observed in use at the time of URS' site visit.

3.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

3.1 Confined Spaces

A written confined spaces program is not applicable to this facility. A confined space program was not identified on site.

3.2 Hearing Conservation

A site-specific written hearing conservation program was not identified on site. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise dosimetry results and a review of normal site operations, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was not identified on site. No operations were observed by URS that would require the use of respiratory protection.

3.4 Hazard Communication

A site-specific hazard communication program was not identified on site.

Material safety data sheets and list of full time personnel were not readily available on the day of the survey. A site map was made available.

3.5 Personal Protective Equipment

A written personal protective equipment program was not identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site.

3.7 Safety

No evidence was found that all fire extinguishers were being inspected on a monthly basis. The exterior stairs to the east admin hall did not have a handrail installed. Chemical products were observed to be improperly stored in the drill hall, kitchen, and boiler room. Ladders were stored improperly in the north hall and boiler room.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

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, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006

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

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

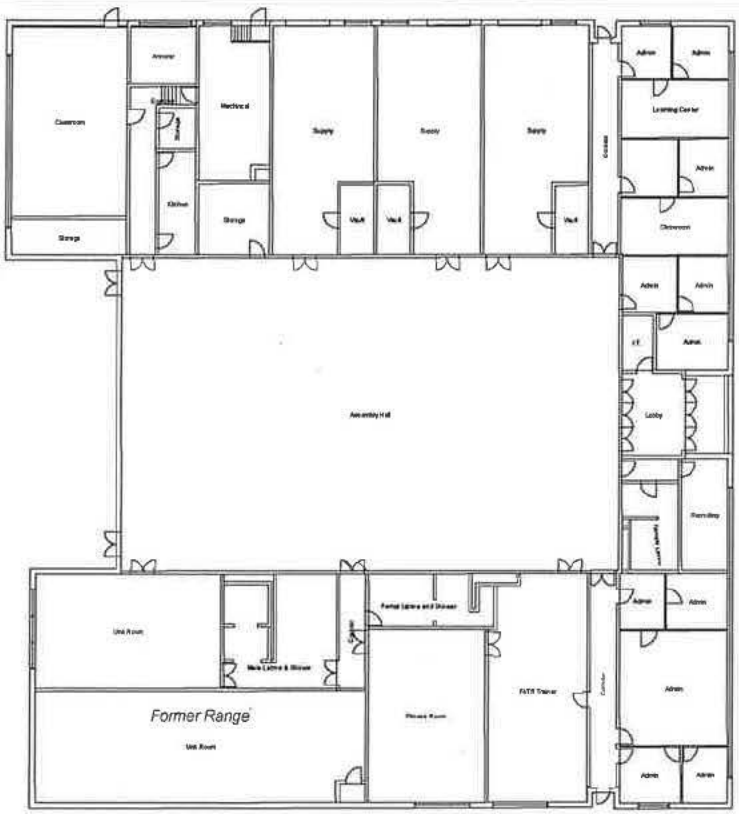
OSHA Clarification Letter – Clarification of “as free as practicable” of lead contamination under 29 CFR 1926.62, 13 January 2003.

APPENDIX A

SHOP DRAWING

CAMBRIDGE - 25A60
Floor Plan

MASSACHUSETTS ARMY NATIONAL GUARD
JOINT FORCE HEADQUARTERS, MILFORD, MA
CONSTRUCTION AND FACILITIES MAINTENANCE OFFICE



0 1 2 4 6 8 10
Meters
0 5 10 20 30 40
Feet

Updated 25 October 2011

APPENDIX B

PERSONNEL LIST

List of Full-Time Personnel was not available at the time of the survey.

APPENDIX C

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515912
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	450 Concord Avenue, Cambridge, MA	**Date Submitted:**	5/17/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Cambridge, MA	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/24/2013 **Report Date:** 5/24/2013

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
13063160	CambridgeRC Wipe-01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13063161	CambridgeRC Wipe-02	Flame	Wipe	****	0.108	110	ug/ft^2	67	620	ug/ft^2	
13063162	CambridgeRC Wipe-03	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13063163	CambridgeRC Wipe-04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13063164	CambridgeRC Wipe-05	Flame	Wipe	****	0.108	110	ug/ft^2	26	240	ug/ft^2	
13063166	CambridgeRC Wipe-06	Flame	Wipe	****	0.108	110	ug/ft^2	67	620	ug/ft^2	
13063167	CambridgeRC Wipe-07	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13063168	CambridgeRC Wipe-08	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13063169	CambridgeRC Wipe-09	Flame	Wipe	****	0.108	110	ug/ft^2	480	4500	ug/ft^2	
13063170	CambridgeRC Wipe-10	Flame	Wipe	****	0.108	110	ug/ft^2	34	320	ug/ft^2	
13063171	CambridgeRC Wipe-FB	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	MA ARNG	**Chain Of Custody:**	515912
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	450 Concord Avenue, Cambridge, MA	**Date Submitted:**	5/17/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Cambridge, MA	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	5/24/2013 **Report Date:** 5/24/2013

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
13063172	CambridgeRC LP-01	Flame	Paint Chip	****	N/A	0.0058	%Pb		0.11	%Pb	
13063173	CambridgeRC LP-02	Flame	Paint Chip	****	N/A	0.0096	%Pb		0.13	%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

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

OW(410) 247-2024 159202 210 REV. 8.08

515912

page 1 of 2

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: MA ARNG
2. Job Location: 450 Concord Ave, Cambridge, MA
3. Job #: Cambridge RC P.O. #: W912K6-09-A-0003
4. Contact Per[redacted]
5. Submitted B[redacted]

Reporting Information (Results will be provide[redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REP[redacted]
❑ Immediate Date Due: ____ ❑ 24 Hours Time Due: ____ Comments: ____	❑ Immediate ❑ 3 Day ❑ Next Day ☒ 5 Day + ❑ 2 Day Date Due: 5/24/13 ❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Inc[redacted] with Report ☒ [redacted] @ urs.com ❑ 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 ____ (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 ghost) 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)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Cambridge RC wipe 01	admin	5/16/13		158 cm²				X				X				
Cambridge RC wipe 02	↓	↓		↓				X				X				
Cambridge RC wipe 03								X				X				
Cambridge RC wipe 04								X				X				
Cambridge RC wipe 05	↓							X				X				
Cambridge RC wipe 06	Maintenance							X				X				
Cambridge RC wipe 07	↓							X				X				
Cambridge RC wipe 08								X				X				
Cambridge RC wipe 09								X				X				
Cambridge RC wipe 10	↓							X				X				
Cambridge RC wipe FB	Field Blank			↓				X				X				
Cambridge RC LPC1	Non-boiler rm	↓						X			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: 5 / 17 / 13 @ ____ Via: FedEx By (Print): [redacted]
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____
3. Results Reported To: ____ Via: ____ Date: ____ / ____ / ____ Time: ____ Initials: ____
4. Comments: 7940 0954 8840

page 2

Call (410) 247-2024

159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
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(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) S15912

page 2 of 2

Mailing/Billing Information:

1. Client Name: National Guard Bureau
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4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: MA ARNG
2. Job Location: 450 Concord Ave, Cambridge, MA
3. Job #: Cambridge BC PO #: W912K6-09-A-0003
4. Contact Perso[redacted]
5. Submitted by: [redacted]

Non-Responsive Non-Responsive

Reporting Information (Results will be provided as soon as reasonably feasible): [redacted] priority

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☒ Include COC/Field Data Sheets with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	☐ [redacted] Non-Responsive .mil.com
Comments:	☐ 2 Day Date Due:	☐ Fax [redacted]@us.army.mil
	☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	☐ 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 (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) (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	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
Cambridge BC-LP02	green-white paint	5/16/13						X			X						Date/Time: Contact: By:
																	Date/Time: Contact: By:
																	Date/Time: Contact: By:

Non-Responsive

LABORATORY STAFF ONLY:

1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Date: / / Time: Initials:
4. Comments:

(CUSTODY)

2 of 2

APPENDIX D

PHOTOGRAPHIC LOG

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Cambridge RC	450 Concord Ave., Cambridge, MA	39743799

Photo No.	Date:
1	5/16/13

Description:

Ladder improperly stored in hallway and no entry mat at entrance.

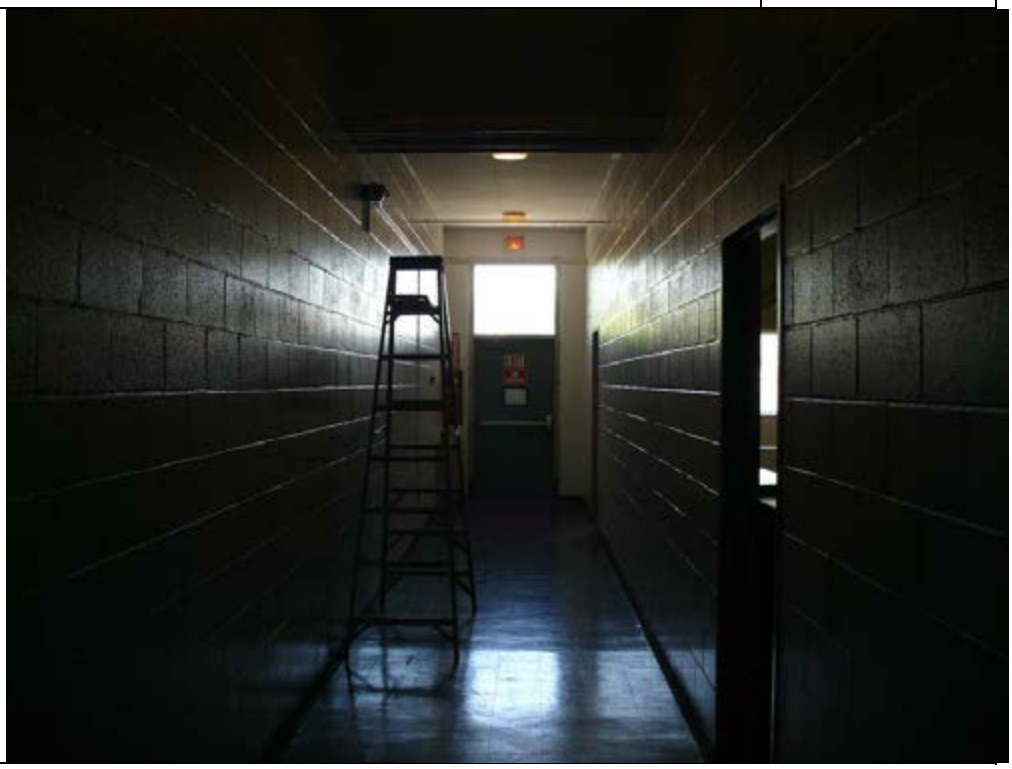


Photo No.	Date:
2	5/16/13

Description:

Exterior stairway to east admin hallway does not have a handrail.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
MA ARNG- Cambridge RC	450 Concord Ave., Cambridge, MA	39743799

Photo No.	Date:
3	5/16/13

Description:

Ladders observed improperly stored in the boiler room.

Photo No.	Date:
4	5/16/13

Description:

Chemicals improperly stored throughout the facility.

APPENDIX E

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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

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 µg/ft^2 on floors and 250 µg/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.

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
CHELSEA READINESS CENTER
113 SPENCER AVENUE
CHELSEA, MASSACHUSETTS

April 2006
PN: 39741508

Non-Responsive
Office Manager

Non-Responsive
Project Manager

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Lead		
Lead was detected in surface wipe samples collected from the former indoor firing range and the drill hall in amounts greater than 200 µg/ft^2	Personnel trained in accordance with the OSHA Lead Standard should clean the former indoor firing range and drill hall where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025)(h)(1))	RAC 4
Asbestos		
Damaged floor tile containing greater than 1% asbestos is present throughout the facility. Exposed pipe insulation was found in the boiler room.	Remove and replace damaged asbestos-containing floor tile. Repair the exposed pipe insulation. Work should be completed by personnel trained in accordance with federal regulations (OSHA 29 CFR 1910.1001)(k)	RAC 3
No site specific asbestos operations and maintenance plan available.	Develop a site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001)(j)	RAC 3
Hazard Communication		
No site specific hazard communication plan available.	Develop a site specific hazard communication plan to manage hazardous materials or dispose of all chemicals properly (OSHA 29 CFR 1910.1200)(e))	RAC 4
Electrical Safety		
Found an exposed electrical power outlet in office #3.	Any electrical openings shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them (OSHA 29 CFR 1910.305)(b)(2)	RAC 2

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 Readiness Center located at 113 Spencer Avenue in Chelsea, Massachusetts 02150. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On January 22, 2004, M[redacted]n industrial hygienist with URS, conducted a site visit to the Readiness Center in Chelsea, Massachusetts. The purpose of this site visit was to conduct an industrial hygiene survey, which included the collection of air samples, bulk samples, and a review of site health and safety procedures. Mr. [redacted] of the Massachusetts ARNG was Mr [redacted] site contact for this survey.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices located throughout the building. The offices were vacant during the time of this survey. It was explained to URS that the building was for sale and would not be occupied by the ARNG.

There were still hazardous chemicals in room #32 (Photos # 3253-54) and in the shower room #30 (Photo # 3256), even though the building was vacant.

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). Relative humidity on the day of the survey ranged from 38.1 – 40.7 % with an average of 39.7%. 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).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide measurements were made at various locations throughout the Readiness Center. Carbon dioxide concentrations ranged from 392 to 425 parts per million (ppm), with an average of 397 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 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 350 ppm on the day of the survey, the ASHRAE limit would be 1050 ppm.

2.2.3 Carbon Monoxide

Carbon monoxide levels were also measured in the Readiness Center. Carbon monoxide concentrations remained at 0 parts per million (ppm) throughout the survey period. This measured level was 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 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. ASHRAE recommends that average carbon monoxide concentrations not exceed 9 ppm. Typical average concentrations found in commercial buildings range from 0 to 6 ppm.

2.2.4 Lead

One paint chip was collected where paint was peeling and sent to AMA Analytical Services, Inc. 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 2-1 below shows the results of the lead paint testing.

Table 2-1
Levels of Lead in Paint Found in the Administrative Area

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Tool Room # 16	0122-LPC03	0.01	<0.01

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 2-2 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 ($\mu g/ft^2$)
Office # 29 – Top of a Table	0122-LW05	1.000	92	200
Office # 5 – Book Case Shelf	0122-LW06	1.000	<12	200
Blank	0122-LWBlank	1.000	<12	200

2.2.5 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 2-3 below presents the results of the sample analysis.

Table 2-3
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Room # 13	Window Glazing	0122-AB02A	NAD
Room # 13	Window Glazing	0122-AB02B	NAD
Room # 13	Window Glazing	0122-AB02C	NAD
Kitchen # 12	9"x9" Brick Color Floor Tile	0122-AB03A-FT	NAD
Kitchen # 12	9"x9" Brick Color Floor Tile	0122-AB03B-FT	NAD

Table 2-3 (Continued)
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Kitchen # 12	9"x9" Light Pink Floor Tile	0122-AB04A-FT	NAD
Kitchen # 12	9"x9" Light Pink Floor Tile	0122-AB04B-FT	NAD
Kitchen # 12	9"x9" Beige Floor Tile	0122-AB05A-FT	2 (chrysotile)
Kitchen # 12	9"x9" Beige Floor Tile	0122-AB05B-FT	2 (chrysotile)
Dining Room # 11	9"x9" Brown Floor Tile	0122-AB06A-FT	2 (chrysotile)
Hall # 6	9"x9" Brown Floor Tile	0122-AB06B-FT	2 (chrysotile)
Kitchen # 12	Associated Floor Tile Mastic	0122-AB07A	NAD
Kitchen # 12	Associated Floor Tile Mastic	0122-AB07B	NAD
Dining Room # 11	Associated Floor Tile Mastic	0122-AB07C	NAD
Dining Room # 11	4" Black Cove Base	0122-AB08A-CB	NAD
Dining Room # 11	4" Black Cove Base	0122-AB08B-CB	NAD
Dining Room # 11	4" Black Cove Base	0122-AB08C-CB	NAD
Dining Room # 11	4" Black Cove Base Mastic	0122-AB08A-M	NAD
Dining Room # 11	4" Black Cove Base Mastic	0122-AB08B-M	NAD
Dining Room # 11	4" Black Cove Base Mastic	0122-AB08C-M	NAD
Dining Room # 11	12"x12" White Ceiling Tile	0122-AB09A	NAD
Room # 1	12"x12" White Ceiling Tile	0122-AB09B	NAD
Room # 1	12"x12" White Ceiling Tile	0122-AB09C	NAD
Room # 34	9"x9" Green Floor Tile	0122-AB10A-FT	2 (chrysotile)
Room # 34	9"x9" Green Floor Tile	0122-AB10B-FT	2 (chrysotile)
Room # 34	Associated Floor Tile Mastic	0122-AB10A-M	2 (chrysotile)
Room # 34	Associated Floor Tile Mastic	0122-AB10B-M	2 (chrysotile)
Room # 34	Brown Glue Daubs	0122-AB11A	NAD
Room # 34	Brown Glue Daubs	0122-AB11B	NAD
Room # 34	Brown Glue Daubs	0122-AB11C	NAD
Room # 28	White Joint Compound	0122-AB12A	NAD
Room # 28	White Joint Compound	0122-AB12B	NAD
Room # 28	White Joint Compound	0122-AB12C	NAD
Room # 28	4" Brown Cove Base	0122-AB13A	NAD
Room # 28	4" Brown Cove Base	0122-AB13B	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.

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

LEAD: The two surface wipes and one paint chip sample collected in this area for lead were found to be within the allowable limits and require no further action at this time.

ASBESTOS: The 9"x9" beige floor tile in the kitchen (Photo # 3245), 9"x9" brown floor tile in the dining hall #11 and hallway #6 (Photo # 3247) and the 9"x9" green floor tile in room #34 (Photo # 3251) were determined to contain asbestos in a concentration greater than one percent. It is recommended that the damaged tiles be replaced with new, non-asbestos tile by an appropriately trained technician.

ELECTRICAL: An exposed electrical power outlet was found in office #3 (Photo # 3250). URS recommends repairing the outlet or cutting the power to it and covering it up.

3.0 FORMER FIRING RANGE

3.1 Operation Description

The firing range has been dismantled and was vacant at the time of this survey.

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 ($\mu g/ft^2$)
Firing Range – Book Case Shelf	0122-LW07	1.000	150	200
Firing Range – Top of a Light Guard	0122-LW08	0.889	7,100	200
Firing Range – Floor – Center	0122-LW09	1.000	1,200	200
Firing Range – Floor – Bullet Trap	0122-LW10	1.000	27,000	200
Blank	0122-LWBlank	N/A	<12 μg	N/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
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	0122-LA01	956	<3.1	50.0
Blank	0122-LA03	0	<3.0	50.0

On the day of the survey, the airborne lead dust level in the former indoor firing range was found to be acceptable, 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.

Paint chips were collected where paint was peeling and sent to AMA for analysis. Two of the four 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 3-3 below shows the results of the lead paint testing.

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

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Former Indoor Firing Range	0122-LPC04	0.01	9.0
Former Indoor Firing Range	0122-LPC05	0.01	0.74
Former Indoor Firing Range	0122-LPC06	0.01	0.03
Former Indoor Firing Range	0122-LPC07	0.01	0.28

The analytical report from AMA is contained in Appendix D.

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: Surface wipe samples collected in the former firing range were found to contain levels of lead dust which exceed the maximum limit set by the National Guard Bureau Region North Industrial Hygiene Office (See Appendix F). The black and teal peeling paint (Photo # 3260) were found to contain lead above the HUD guidelines. URS recommends that an appropriately licensed lead contractor stabilize the peeling paint and clean the former indoor firing range. Guidelines for the cleanup and rehabilitation of indoor firing ranges are included in Appendix H.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is a 7,000 square foot area with about a 30-foot high ceiling used for assembling personnel. The walls are constructed of bricks and the floor is wood.

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 – Top of the Bleachers	0122-LW01	0.938	<13.0	200
Drill Hall – Floor	0122-LW02	1.000	140	200
Drill Hall – Center Court	0122-LW03	1.000	<12	200
Drill Hall #27-Top of the Pepsi Machine	0122-LW04	1.000	420	200
Blank	0122-LWBlank	N/A	<12 µg	N/A

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

Table 4-2
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Drill Hall	0122-LA02	964	<3.1	50.0
Blank	0122-LA03	0	<3.0	50.0

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 50.0 $\mu g/m^3$ 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: One of the four surface wipe samples collected in the drill hall for lead was found to contain a level of lead dust which exceeded the maximum limit set by the National Guard Bureau Region North Industrial Hygiene Office (See Appendix F). URS recommends that the vending machines be cleaned by personnel trained in accordance with the OSHA Lead Standard (29 CFR 1910.1025 and 29 CFFR 1926.62).

5.0 BOILER ROOM

5.1 Operation Description

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

5.2 Chemical and Physical Agents Sampled

5.2.1 Lead

Paint chips were collected in areas where paint was peeling and sent to AMA for analysis. Both 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 Act of 1992 (also referred to as Title X)). Table 5-1 below shows the results of the lead paint testing.

Table 5-1
Levels of Lead in Paint Found in the Boiler Room

Sample Location	URS Sample Number	Reporting Limit (% by Weight)	Final Result (% by Weight)
Boiler Room	0122-LPC01	0.1	0.016
Boiler Room	0122-LPC02	0.1	0.26

The analytical report from AMA is contained in Appendix D.

5.2.2 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 5-2 below presents the results of the sample analysis.

Table 5-2
Sample Results of Suspect ACM

Sample Location	Material Sampled	URS Sample Number	Total Asbestos (%)
Boiler Room	Pipe Insulation	0122-AB01A	75
Boiler Room	Pipe Insulation	0122-AB01B	60
Boiler Room	Pipe Insulation	0122-AB01C	60

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.

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.

5.5 Interpretation of Results

LEAD: The two paint chip samples collected in the boiler room area for lead were found to contain levels below the U.S. Housing and Urban Development (HUD) Lead-Based Paint Guidelines. No further testing is needed at this time.

ASBESTOS: There were exposed pipe insulation ends (Photo # 3236), which were determined to contain asbestos. These ends need to be repaired by a properly trained, licensed technician.

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. No training records were 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.

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

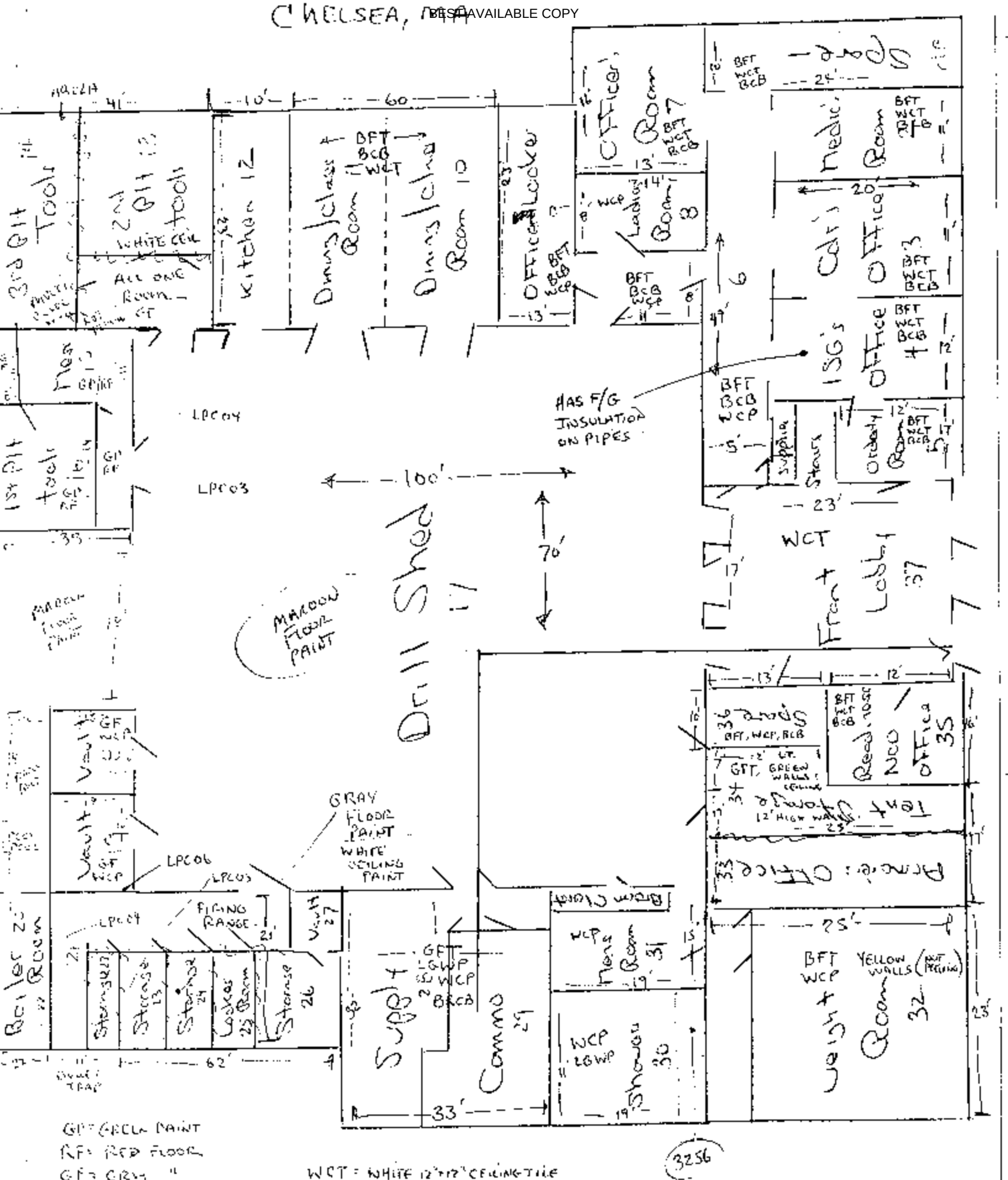
Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

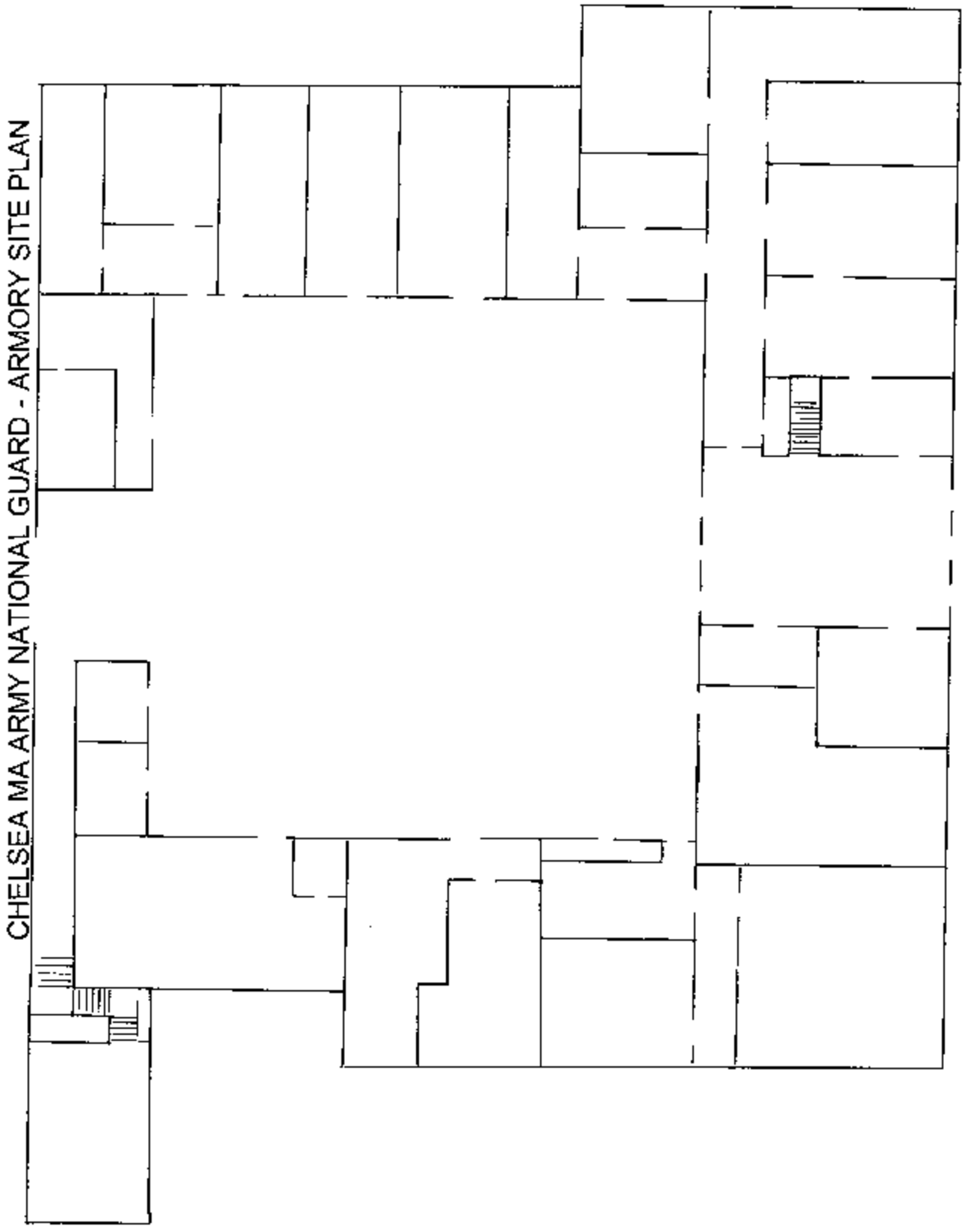
U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

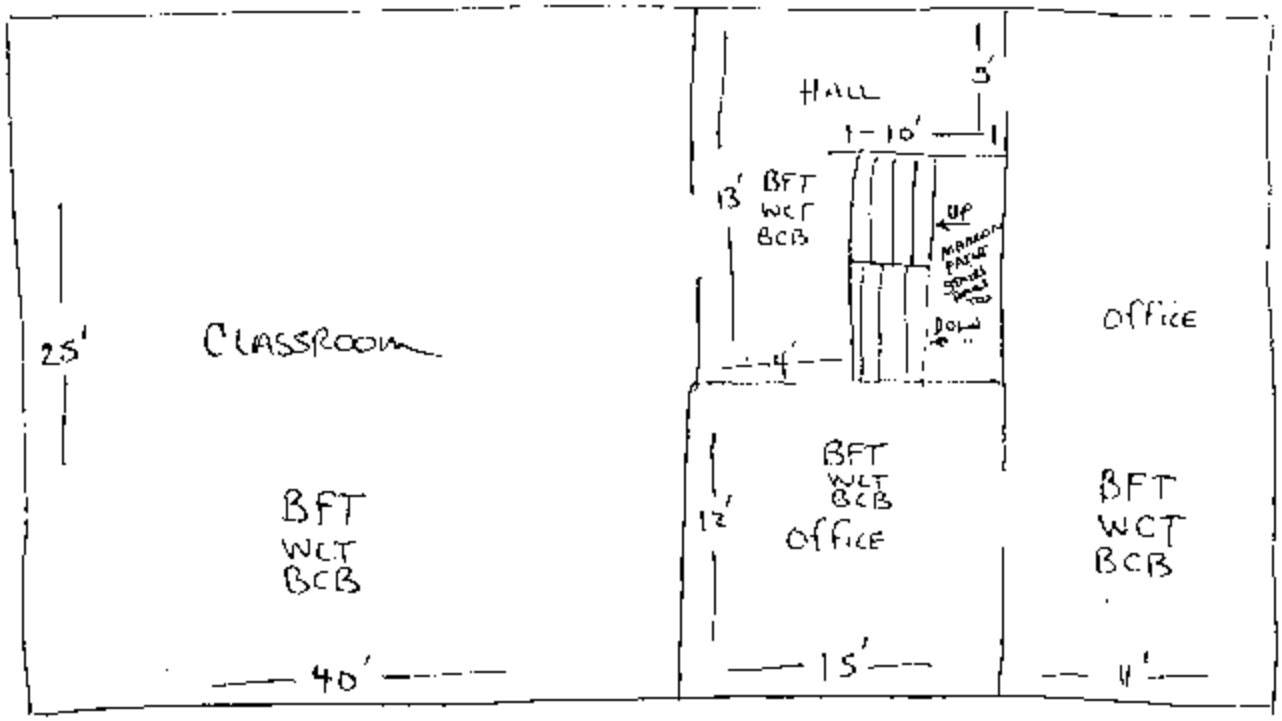
APPENDIX A

READINESS CENTER DRAWING





SECOND FLOOR



FRONT OF BUILDING

APPENDIX B

PERSONNEL LIST

BUILDING IS CURRENTLY UNOCCUPIED

APPENDIX C

HAZARDOUS MATERIALS LIST

NO CHEMICAL INVENTORY AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	URS Corporation	**Job Name:**	Army National Guard	**Chain Of Custody:**	122304
Address:	5 Industrial Way	**Job Location:**	113 Spencer Avenue; Chelsea, MA	**Date Analyzed:**	01/29/2004
	Salem, New Hampshire 03079-2830	**Job Number:**	42056-013-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	29-Jan-04

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
0421851	0122-LW 01	Flame	Wipe	****	0.938	12.80	ug/ft²	< 13	ug/ft²	
0421852	0122-LW 02	Flame	Wipe	****	1.000	12.00	ug/ft²	140	ug/ft²	
0421853	0122-LW 03	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0421854	0122-LW 04	Flame	Wipe	****	1.000	12.00	ug/ft²	420	ug/ft²	
0421855	0122-LW 05	Flame	Wipe	****	1.000	12.00	ug/ft²	92	ug/ft²	
0421856	0122-LW 06	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0421857	0122-LW 07	Flame	Wipe	****	1.000	12.00	ug/ft²	150	ug/ft²	
0421858	0122-LW 08	Flame	Wipe	****	0.889	13.50	ug/ft²	7100	ug/ft²	
0421859	0122-LW 09	Flame	Wipe	****	1.000	12.00	ug/ft²	1200	ug/ft²	
0421860	0122-LW 10	Flame	Wipe	****	1.000	12.00	ug/ft²	27000	ug/ft²	
0421861	0122-LW BLANK	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0421862	0122-LA 01	Flame	Air	956	N/A	3.14	ug/m³	< 3.1	ug/m³	
0421863	0122-LA 02	Flame	Air	964	N/A	3.11	ug/m³	< 3.1	ug/m³	
0421864	0122-LA 03	Flame	Air Blank	0	N/A	3.00	ug/m³	< 3	ug	
0421865	0122-LPC 01	Flame	Paint Chip	****	N/A	0.01	%Pb	0.016	%Pb	
0421866	0122-LPC 02	Flame	Paint Chip	****	N/A	0.01	%Pb	0.26	%Pb	
0421867	0122-LPC 03	Flame	Paint Chip	****	N/A	0.01	%Pb	< 0.01	%Pb	
0421868	0122-LPC 04	Flame	Paint Chip	****	N/A	0.01	%Pb	9	%Pb	
0421869	0122-LPC 05	Flame	Paint Chip	****	N/A	0.01	%Pb	0.74	%Pb	
0421870	0122-LPC 06	Flame	Paint Chip	****	N/A	0.01	%Pb	0.03	%Pb	

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AMA Analytical Services

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CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	URS Corporation	**Job Name:**	Army National Guard	**Chain Of Custody:**	122304
Address:	5 Industrial Way	**Job Location:**	113 Spencer Avenue; Chelsea, MA	**Date Analyzed:**	01/29/2004
	Salem, New Hampshire 03079-2830	**Job Number:**	42056-013-211	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	29-Jan-04

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
0421871	0122-LPC 07	Flame	Paint Chip	****	N/A	0.01	%Pb	0.28	%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

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

Analyst: [redacted] Non-Responsive **Technical Manager:** [redacted]

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Address:	5 Industrial Way	**Job Location:**	113 Spencer Avenue; Chelsea, MA	**Date Analyzed:**	01/29/2004
	Salem, New Hampshire 03079-2830	**Job Number:**	42056-013-211	**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	Analyst ID	Comments
0421872	0122-AB 01 A	75	75	--	--	--	--	--	5	--	--	20	Gray	LB	
0421873	0122-AB 01 B	60	60	--	--	--	--	--	--	--	--	40	Gray	LB	
0421874	0122-AB 01 C	60	60	--	--	--	--	--	10	--	--	30	Gray	LB	
0421875	0122-AB 02 A	NAD	--	--	--	--	--	--	--	--	TR	100	Off-White	LB	
0421876	0122-AB 02 B	NAD	--	--	--	--	--	--	TR	--	--	100	White	LB	
0421877	0122-AB 02 C	NAD	--	--	--	--	--	--	TR	--	--	100	Off-White	LB	
0421878	0122-AB 03 A-FT	NAD	--	--	--	--	--	--	--	--	--	100	Multi	LB	
0421879	0122-AB 03 A-M	--	--	--	--	--	--	--	--	--	--	--		LB	Sample Not Analyzed
0421880	0122-AB 03 B-FT	NAD	--	--	--	--	--	--	--	--	--	100	Multi	LB	
0421881	0122-AB 03 B-M	--	--	--	--	--	--	--	--	--	--	--		LB	Sample Not Analyzed
0421882	0122-AB 04 A-FT	NAD	--	--	--	--	--	--	--	--	--	100	Multi	LB	
0421883	0122-AB 04 A-M	--	--	--	--	--	--	--	--	--	--	--		LB	Sample Not Analyzed
0421884	0122-AB 04 B-FT	NAD	--	--	--	--	--	--	--	--	--	100	Multi	LB	
0421885	0122-AB 04 B-M	--	--	--	--	--	--	--	--	--	--	--		LB	Sample Not Analyzed

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Address:	5 Industrial Way	**Job Location:**	113 Spencer Avenue; Chelsea, MA	**Date Analyzed:**	01/29/2004
	Salem, New Hampshire 03079-2830	**Job Number:**	42056-013-211	**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	Analyst ID	Comments
0421886	0122-AB 05 A-FT	2	2	--	--	--	--	--	--	--	--	98	Beige	LB	
0421887	0122-AB 05 A-M	--	--	--	--	--	--	--	--	--	--	--		LB	Sample Not Analyzed
0421888	0122-AB 05-B-FT	2	2	--	--	--	--	--	--	--	--	98	Beige	LB	
0421889	0122-AB 05-B-M	--	--	--	--	--	--	--	--	--	--	--		LB	Sample Not Analyzed
0421890	0122-AB 06 A-FT	2	2	--	--	--	--	--	--	--	--	98	Brown	LB	
0421891	0122-AB 06 A-M	--	--	--	--	--	--	--	--	--	--	--		LB	Sample Not Analyzed
0421892	0122-AB 06 B-FT	2	2	--	--	--	--	--	--	--	--	98	Brown	LB	
0421893	0122-AB 06 B-M	--	--	--	--	--	--	--	--	--	--	--		LB	Sample Not Analyzed
0421894	0122-AB 07 A	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0421895	0122-AB 07 B	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0421896	0122-AB 07 C	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0421897	0122-AB 08 A-CB	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0421898	0122-AB 08 A-M	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	

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.

AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

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Address:	5 Industrial Way	**Job Location:**	113 Spencer Avenue; Chelsea, MA	**Date Analyzed:**	01/29/2004
	Salem, New Hampshire 03079-2830	**Job Number:**	42056-013-211	**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	Analyst ID	Comments
0421899	0122-AB 08 B-CB	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0421900	0122-AB 08 B-M	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0421901	0122-AB 08 C-CB	NAD	--	--	--	--	--	--	--	--	--	100	Black	LB	
0421902	0122-AB 08 C-M	NAD	--	--	--	--	--	--	TR	--	--	100	Black	LB	
0421903	0122-AB 09 A	NAD	--	--	--	--	85	--	--	--	--	15	Multi	LB	
0421904	0122-AB 09 B	NAD	--	--	--	--	70	--	--	--	--	30	Multi	LB	
0421905	0122-AB 09 C	NAD	--	--	--	--	70	--	TR	--	--	30	Multi	LB	
0421906	0122-AB 10 A-FT	2	2	--	--	--	--	--	--	--	--	98	Green	LB	
0421907	0122-AB 10 A-M	2	2	--	--	--	--	--	--	--	--	98	Black	LB	
0421908	0122-AB 10 B-FT	2	2	--	--	--	--	--	--	--	--	98	Green	LB	
0421909	0122-AB 10 B-M	2	2	--	--	--	--	--	--	--	--	98	Black	LB	
0421910	0122-AB 11 A	NAD	--	--	--	--	--	--	TR	--	--	100	Yellow	LB	
0421911	0122-AB 11 B	NAD	--	--	--	--	--	--	TR	--	--	100	Yellow	LB	
0421912	0122-AB 11 C	NAD	--	--	--	--	--	--	TR	--	--	100	Yellow	LB	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	URS Corporation	**Job Name:**	Army National Guard	**Chain Of Custody:**	122304
Address:	5 Industrial Way	**Job Location:**	113 Spencer Avenue; Chelsea, MA	**Date Analyzed:**	01/29/2004
	Salem, New Hampshire 03079-2830	**Job Number:**	42056-013-211	**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	Analyst ID	Comments
0421913	0122-AB 12 A	NAD	--	--	--	--	--	--	--	--	--	100	Off-White	LB	
0421914	0122-AB 12 B	NAD	--	--	--	--	--	--	--	--	--	100	Off-White	LB	
0421915	0122-AB 12 C	NAD	--	--	--	--	--	TR	--	--	--	100	White	LB	
0421916	0122-AB 13 A	NAD	--	--	--	--	--	--	--	--	--	100	Brown	LB	
0421917	0122-AB 13 B	NAD	--	--	--	--	--	--	--	--	--	100	Brown	LB	

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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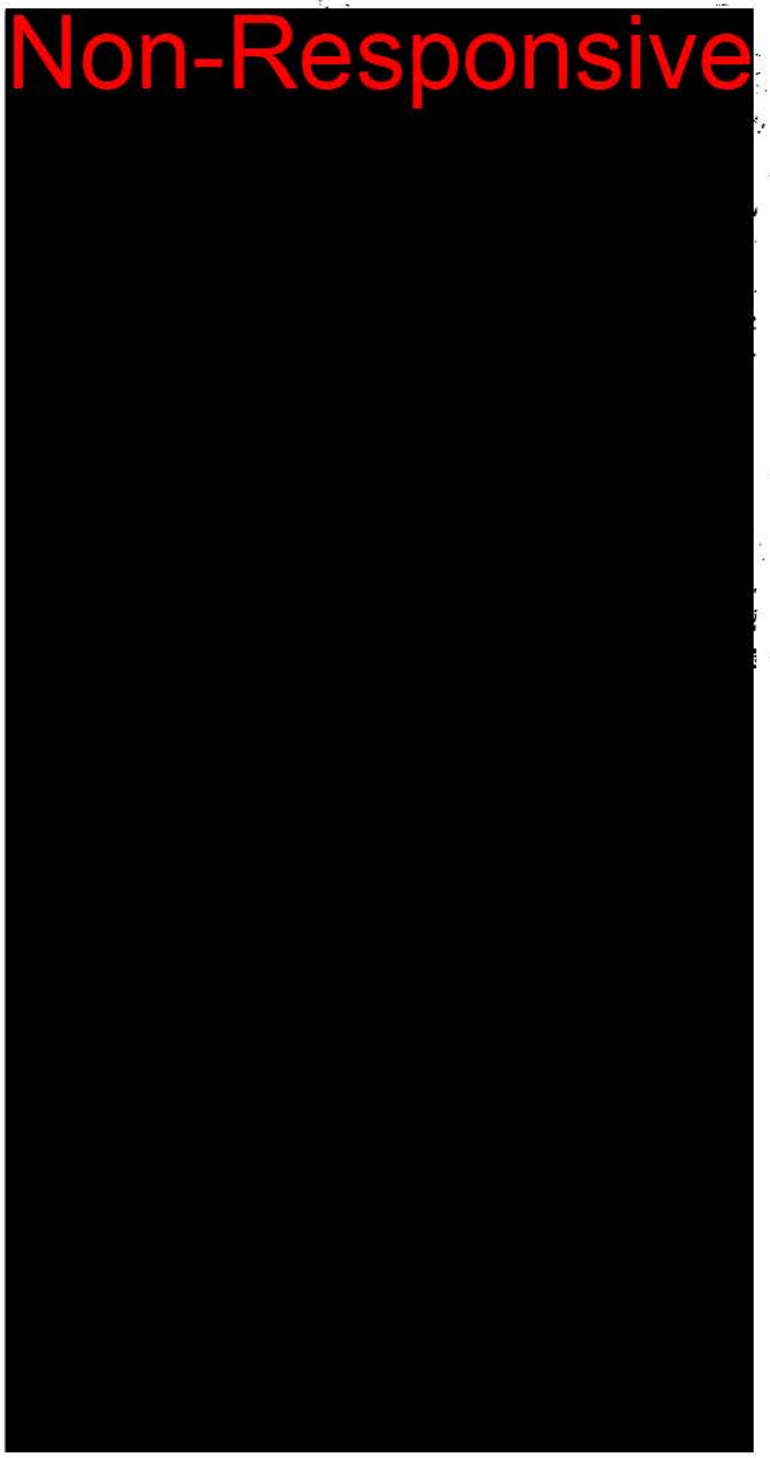
APPENDIX E

TRAINING CERTIFICATES



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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 as:

Asbestos Inspector Refresher

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

April 11, 2003
Course Dates

Course Location
Institute for Environmental Education
16 Upton Drive
Wilmington, MA 01887

April 11, 2003
Examination Date

03518010625349
Certificate Number

April 10, 2004
Expiration Date

[redacted]

APPENDIX F

PHOTOGRAPHS

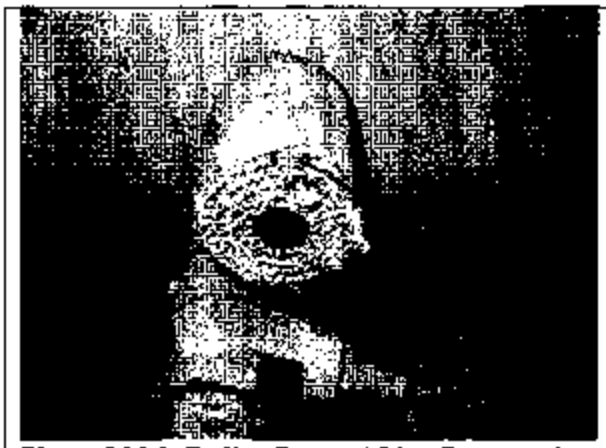


Photo 3236: Boiler Room #20 - Damaged asbestos-containing pipe insulation

Photo 3245: Kitchen – Missing and damaged asbestos-containing floor tile

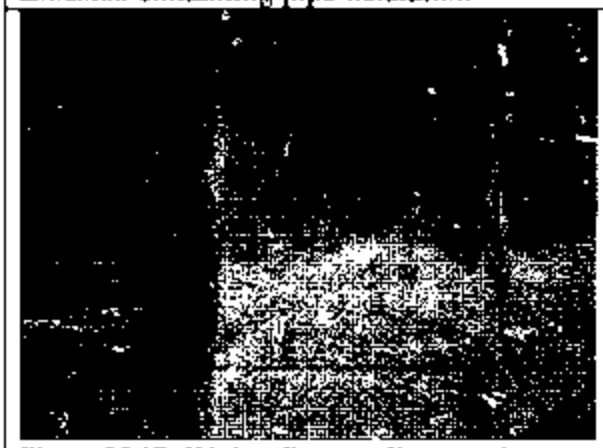


Photo 3247: Dining Room - Damaged asbestos-containing floor tile

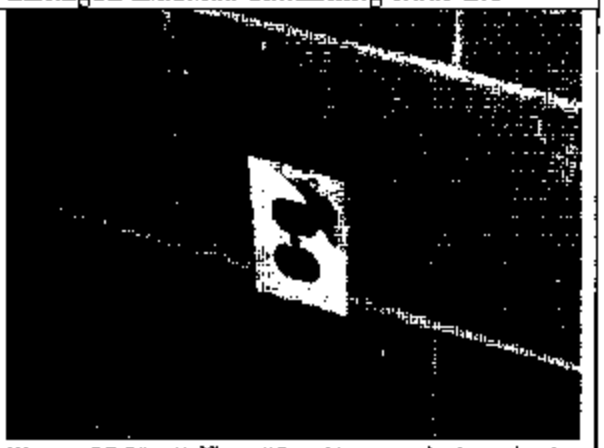


Photo 3250: Office #3 – Exposed electrical outlet

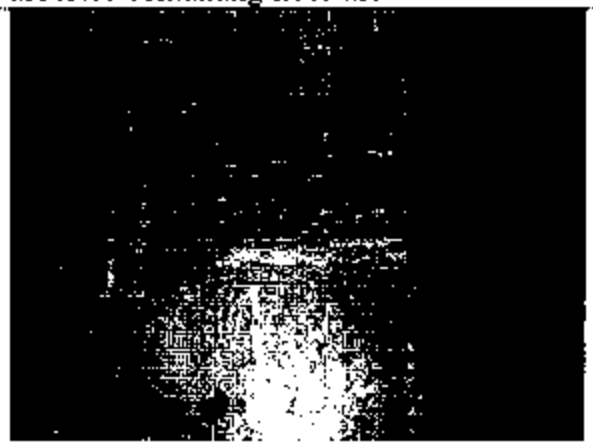


Photo 3251: Room #34 - Damaged asbestos-containing floor tile

Photo 3253: Room 32 - Abandoned chemicals

Photo 3254: Room #32 – Abandoned chemicals

Photo 3256: Shower Room #30 – Flammable Cabinet without inventory

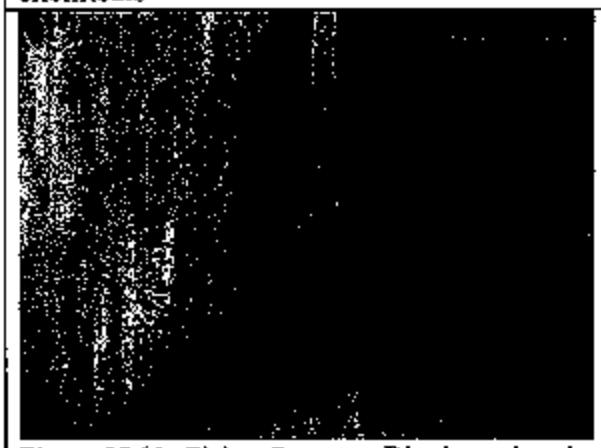


Photo 3260: Firing Range – Black, teal and Aqua paint

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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.

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

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)

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).

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 42 [illegible] paper

(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

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.

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.

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.

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.

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.

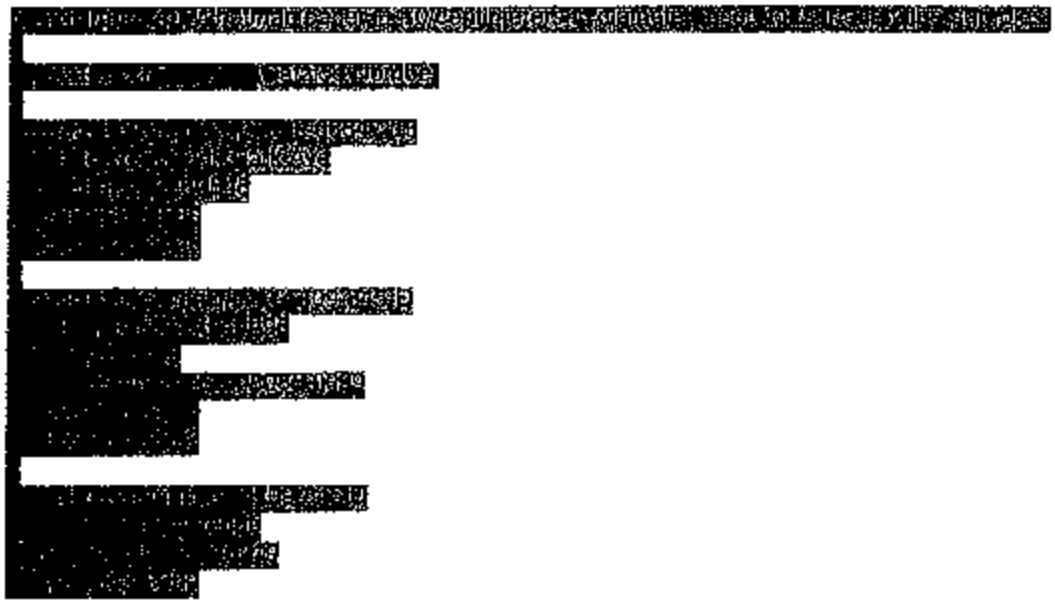
Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381M

APPENDIX E (Continued)

800-247-8628
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

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

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:

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:

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

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.

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
CHICOPEE ARMORY
371 ARMORY DRIVE
CHICOPEE, MASSACHUSETTS

January 2006
PN: 39741508

Non-Responsive
Office Manager

Non-Responsive
Project Manager

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TABLE OF CONTENTS

Section **Page**

TABLE OF CONTENTS (Cont)

APPENDICES

FINDINGS AND RECOMMENDATIONS

Findings	Recommendation	Risk Assessment Code
Lighting		
On the day of the survey, the illuminance in the administrative area was inadequate in a few areas.	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
Lead		
Lead was detected in wipe samples collected from the former firing range and drill hall in amounts greater than 200 $\mu g/ft^2$	Personnel trained in accordance with the OSHA Lead Standard should clean the drill hall where lead was detected in quantities of greater than 200 micrograms per square foot (OSHA 29 CFR 1910.1025(h)(1))	RAC 4
Asbestos		
No site specific asbestos operations and maintenance plan available.	Develop a site specific asbestos operations and maintenance plan to manage asbestos-containing materials (OSHA 29 CFR 1910.1001(j))	RAC 3
Hazard Communication		
No site specific hazard communication plan available.	Develop a site specific hazard communication plan to manage hazardous materials (OSHA 29 CFR 1910.1200(e))	RAC 4

1.0 SUMMARY

At the request of the National Guard Bureau Region North Industrial Hygiene Office (NGB), URS Corporation (URS) conducted an industrial hygiene survey at the Armory located at 371 Armory Drive in Chicopee, Massachusetts 01013. This report includes an executive summary, a description of the survey protocol, a discussion of the survey evaluation and findings and a list of conclusions and recommendations.

On February 5, 2004, Mr Non-Responsive an industrial hygienist with URS, conducted a site visit to the Armory in Chicopee, Massachusetts. 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. SGT Non-Responsive of the Commonwealth of Massachusetts National Guard was Mr. Non-Responsive site contact for this survey. The Armory regularly has four full time employees. During Mr. Non-Responsive visit SGT Non-Responsive was the only National Guard personnel on site.

A shop layout drawing of the facility, which shows the locations where measurements were made during this survey, is contained in Appendix A.

2.0 ADMINISTRATIVE AREA

2.1 Operation Description

This building area contains multiple offices, classrooms and storage areas. Asbestos-containing materials in the form of floor tile and pipe insulation were found to be in good condition. There was no evidence of any water incursions and URS' point of contact expressed no concerns regarding indoor air quality, ergonomics or lighting.

2.2 Chemical and Physical Agents Sampled

2.2.1 Relative Humidity

Relative humidity levels were measured using a TSI Q-Track (Model 8551). The relative humidity level on the day of the survey averaged 15.4%. 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).

2.2.2 Carbon Dioxide

On the day of the survey, carbon dioxide levels averaged of 455 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 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. Since interior carbon dioxide levels were below 700 ppm an outside reading was not collected.

2.2.3 Carbon Monoxide

Carbon monoxide levels were also measured in the Armory. The carbon monoxide concentration averaged 0.1 parts per million (ppm) throughout the survey period. This measured level was 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 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. 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.

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 Illuminance (lux / foot candles)	Recommended Illuminance (lux / foot candles)
Orderly Room	Administrative Duties	202 / 18.8	500 / 50
Building Maintenance	Administrative some bench work	323 / 30.0	500 / 50
Classroom	Administrative Duties	633 / 58.8	500 / 50

On the day of the survey the illuminance in the administrative area was inadequate in two of the areas measured.

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 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 Acceptable Surface Contamination Level ($\mu g/ft^2$)
Locker Room – Locker Top	0205-16	1.000	290	200
Locker Room Floor	0205-17	1.000	21	200
Classroom	0205-18	1.000	23	200
Blank	0205-09	N/A	<12	200

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.

LIGHTING: On the day of the survey, the illuminance in the administrative area was inadequate in a few offices. URS recommends increasing lighting in these few administrative areas through the use of task lighting.

LEAD: Three of the four dust wipe samples that were tested for leed, were found to be below the 200 micrograms per square foot limit established by the National Guard Bureau (See Appendix F) the exception being the sample collected from the locker top in the locker room. URS recommends that the locker room be cleaned by personnel trained in accordance with the OSHA lead standard (29 CFR1910.1025).

3.0 FORMER FIRING RANGE

3.1 Operation Description

The 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 Lighting

Lighting in the former firing range was measured using a Sper Scientific Ltd. Light Meter (Model 840020C). Table 3-1 below shows lighting measurements and the recommended lighting requirement (ANSI / IESNA RP –1-04 American National Standard Practice for Office Lighting)

Table 3-1
Lighting Measurements and Recommended Lighting Requirements

Location	Function	Measured Illuminance (lux / foot candles)	Recommended Illuminance (lux / foot candles)
Former Firing Range	Storage	441 / 40.0	300 / 30

Lighting in the former firing range was adequate for storage and performing "visual tasks of high contrast and large size".

3.2.2 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 3-2 below shows the results of the lead sampling.

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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 Acceptable Surface Contamination Level ($\mu g/ft^2$)
Former Firing Range – Impact Area	0205-04	1.000	9100	200
Former Firing Range – Firing End	0205-05	1.000	91	200
Former Firing Range – Impact Area	0205-10	1.000	82	200
Former Firing Range – Center	0205-11	1.000	150	200
Former Firing Range – Firing End	0205-12	1.000	190	200
Blank	0205-09	N/A	<12 µg	N/A

One air sample for lead dust was also collected in the former firing range. Table 3-3 below shows the result of this air sample.

Table 3-3
Level of Lead Found in the Air

Sample Location	URS Sample Number	Air Volume (L)	Result ($\mu g/m^3$)	OSHA's PEL($\mu g/m^3$)
Former Firing Range	0205-01	360	<8.3	50.0

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 50.0 $\mu g/m^3$ averaged over an 8-hour day. The analytical report from AMA is contained in Appendix D.

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

LIGHTING: The lighting in the former firing range was adequate for storage and performing "visual tasks of high contrast and large size".

LEAD: A dust wipe sample collected from the impact area of the former firing range contained a lead level forty five times greater than the allowable limit established by the National Guard Bureau (See Appendix F). URS recommends that technicians trained in accordance with OSHA's Lead Standard (29 CFR 1910.1025) clean this area. The NGB 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 provided in Appendix H.

4.0 DRILL HALL

4.1 Operation Description

The drill hall is used for assembling personnel and storing vehicles and equipment. The walls are constructed of cinder-block with a concrete floor.

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 Illuminance (lux / foot candles)	Recommended Illuminance (lux / foot candles)
Drill Hall Center	Assembly and Storage	452 / 42.0	300 / 30

Lighting in the former firing range was adequate for assembly and storage and performing "visual tasks of high contrast and large size".

4.2.2 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 4-2 below shows the results of the lead sampling.

Table 4-2
Levels of Lead Dust Found in the Drill Hall

Sample Location	URS Sample Number	Area Wiped (ft^2)	Result ($\mu g/ft^2$)	Maximum Safe Surface Contamination Level ($\mu g/ft^2$)
Drill Hall – Outside MP Vault	0205-06	1.000	120	200
Drill Hall- Floor Outside Former firing Range	0205-07	1.000	250	200
Drill Hall – Near Foyer	0205-08	1.000	71	200
Drill Hall – Center	0205-13	1.000	57	200
Drill Hall – Vending Machine	0205-14	1.000	120	200
Drill Hall – At Foyer Door	0205-15	1.000	<12	200
Blank	0205-09	N/A	<12	200

One air sample for lead dust was 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	0205-02	360	<8.3	50.0

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 50.0 $\mu g/m^3$ 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

LIGHTING: The lighting in the former firing range was adequate for assembly and storage and performing "visual tasks of high contrast and large size".

LEAD: The wipe sample collected from the floor outside of the former firing range in the drill hall was found to contain lead above the allowable limit established by the National Guard Bureau (See Appendix F). URS recommends cleaning the drill hall where lead was detected in quantities of greater than 200 micrograms per square foot in accordance with OSHA' lead standard (29 CFR 1910.1025). The NGB has prepared a memorandum titled "Recommendations for Surface Lead Dust in Armories" which is provided in Appendix G.

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. Asbestos-containing materials in this area were in good condition.

5.2 Chemical and Physical Agents Sampled

URS did not sample for any chemical or physical agents in this building 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: The asbestos-containing materials present in the boiler room were in good condition and require no action at this time.

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. No training records were 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.

No chemical inventory on site.

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.

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

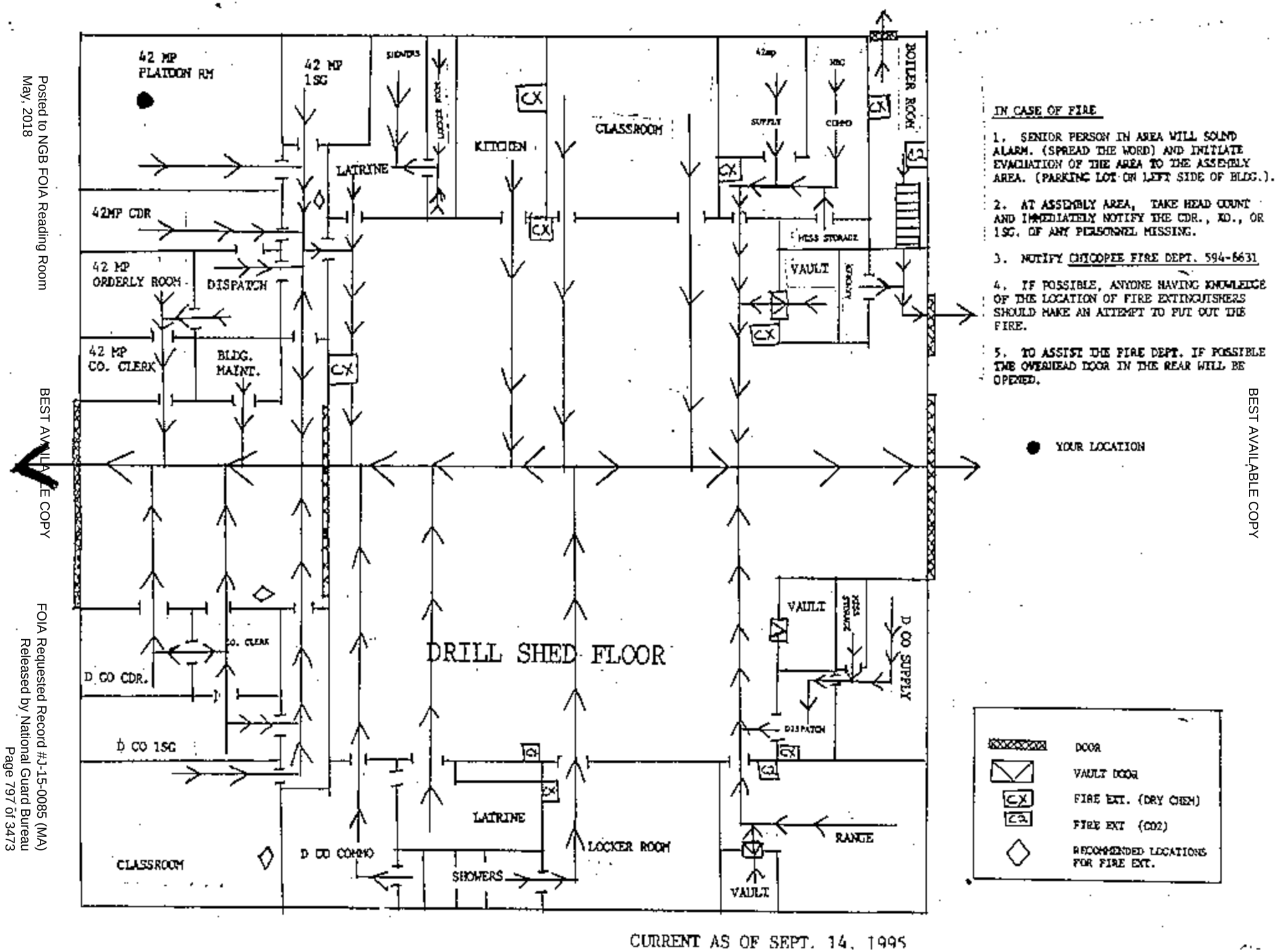
Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (1995, 1997)

U. S. Occupational Safety and Health Administration

Standard for General Industry: 29 CFR 1910

APPENDIX A

SHOP DRAWING



IN CASE OF FIRE

1. SENIOR PERSON IN AREA WILL SOUND ALARM. (SPREAD THE WORD) AND INITIATE EVACUATION OF THE AREA TO THE ASSEMBLY AREA. (PARKING LOT ON LEFT SIDE OF BLDG.).

2. AT ASSEMBLY AREA, TAKE HEAD COUNT AND IMMEDIATELY NOTIFY THE CDR., XO., OR 1SG. OF ANY PERSONNEL MISSING.

3. NOTIFY CHICOPEE FIRE DEPT. 594-8631

4. IF POSSIBLE, ANYONE HAVING KNOWLEDGE OF THE LOCATION OF FIRE EXTINGUISHERS SHOULD MAKE AN ATTEMPT TO PUT OUT THE FIRE.

5. TO ASSIST THE FIRE DEPT. IF POSSIBLE THE OVERHEAD DOOR IN THE REAR WILL BE OPENED.

● YOUR LOCATION

CURRENT AS OF SEPT. 14, 1995

APPENDIX B

PERSONNEL LIST

NOT PROVIDED

APPENDIX C

HAZARDOUS MATERIALS LIST

NOT AVAILABLE

APPENDIX D

ANALYTICAL RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Armory	**Chain Of Custody:**	128457
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Chicopee, MA	**Date Analyzed:**	6/4/2004
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	BPA #W912K6-04-A0002	**Report Date:**	04-Jun-04
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
0448645	0205-04	Flame	Wipe	****	1.000	12.00	ug/ft²	9100	ug/ft²	
0448646	0205-05	Flame	Wipe	****	1.000	12.00	ug/ft²	91	ug/ft²	
0448647	0205-06	Flame	Wipe	****	1.000	12.00	ug/ft²	120	ug/ft²	
0448648	0205-07	Flame	Wipe	****	1.000	12.00	ug/ft²	250	ug/ft²	
0448649	0205-08	Flame	Wipe	****	1.000	12.00	ug/ft²	71	ug/ft²	
0448650	0205-09	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0448651	0205-01	Flame	Air	360	N/A	8.33	ug/m³	< 8.3	ug/m³	
0448652	0205-02	Flame	Air	360	N/A	8.33	ug/m³	< 8.3	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

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

Analyst: [redacted] Non-Responsive **ical Manager:** [redacted]

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:**	Chizopee Armory	**Chain Of Custody:**	138339		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	371 Armory Drive; Chizopee, MA	**Date Submitted:**	5/26/2005		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	Not Provided	**Date Analyzed:**	5/31/2005	**Report Date:**	31-May-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
0541991	0205-10	Flame	Wipe	****	1.000	12.00	ug/ft²	82	ug/ft²	
0541992	0205-11	Flame	Wipe	****	1.000	12.00	ug/ft²	150	ug/ft²	
0541993	0205-12	Flame	Wipe	****	1.000	12.00	ug/ft²	190	ug/ft²	
0541994	0205-13	Flame	Wipe	****	1.000	12.00	ug/ft²	57	ug/ft²	
0541995	0205-14	Flame	Wipe	****	1.000	12.00	ug/ft²	120	ug/ft²	
0541996	0205-15	Flame	Wipe	****	1.000	12.00	ug/ft²	< 12	ug/ft²	
0541997	0205-16	Flame	Wipe	****	1.000	12.00	ug/ft²	290	ug/ft²	
0541998	0205-17	Flame	Wipe	****	1.000	12.00	ug/ft²	21	ug/ft²	
0541999	0205-18	Flame	Wipe	****	1.000	12.00	ug/ft²	23	ug/ft²	
0542000	0205-19	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	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]

APPENDIX E

TRAINING CERTIFICATES

Non-Responsive

Certificate of Training

Awarded to

[redacted]

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]

H, CSP, RS

[redacted]

aining Director

APPENDIX F

PHOTOGRAPHS

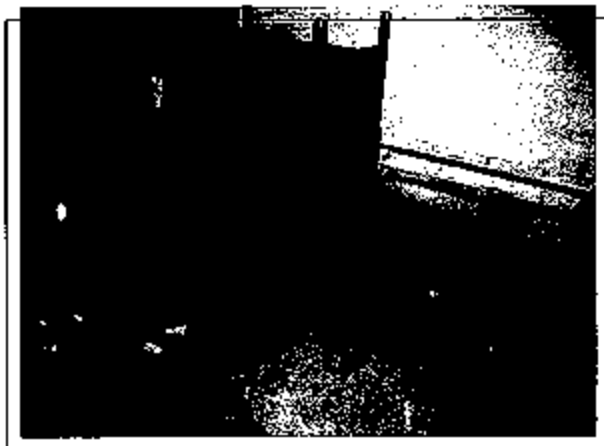


Photo 0001: Former Firing Range – Lead wipe sample 0205-04 (Floor) and lead wipe sample 0205-10 (Desktop)

Photo 0002: Former Firing Range – Lead wipe sample 0205-05

Photo 0003: Drill Floor – Outside MP Vault lead wipe sample 0205-06

Photo 0004: Drill Floor – Outside former firing range lead wipe sample 0205-07

Photo 0005: Drill Floor – Near foyer lead wipe sample 0205-08 (floor) lead wipe sample 0205-14 (vending machine)

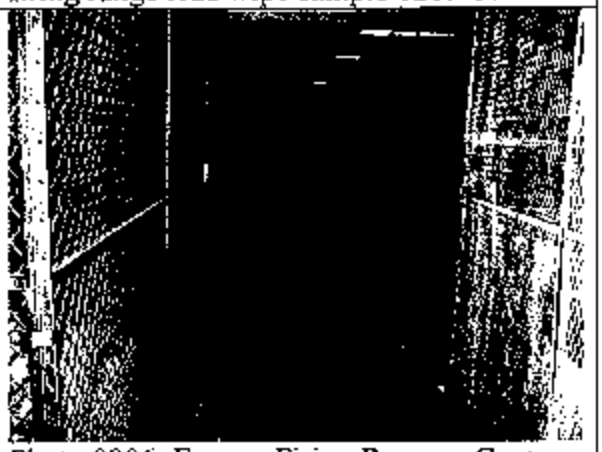


Photo 0006: Former Firing Range Center lead dust wipe sample 0205-11

Photo 0007: Former Firing Range - Lead wipe sample 0205-12

Photo 0008: Drill Floor – Lead wipe sample 0205-13

Photo 0009: Foyer Lead wipe sample 0205-15

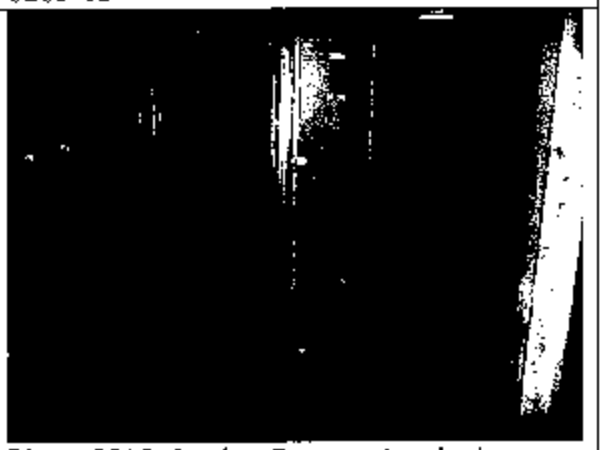


Photo 0010: Locker Room – Lead wipe sample 0205-16 (floor) and ead wipe sample 0205-17 (locker top)

Photo 0011: Classroom – Lead wipe sample 0205-18

Photo 0014: Exterior

APPENDIX G

RECOMMENDATIONS FOR SURFACE LEAD DUST IN ARMORIES

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.

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.

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)

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).

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.

[redacted]

(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.

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.

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.

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.

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.

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.

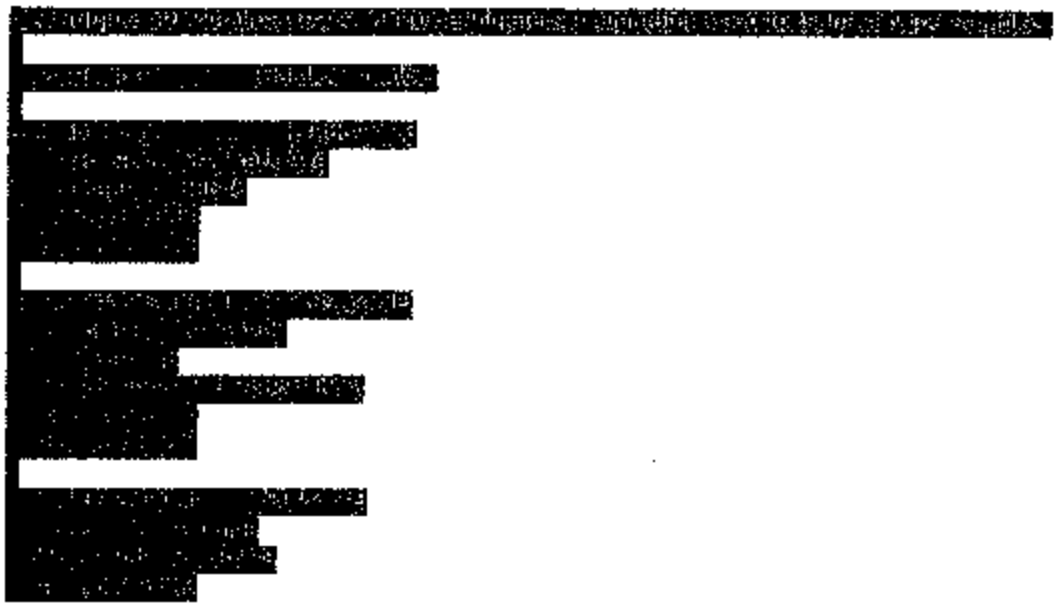
Order From	Catalog Number
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381M

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
304 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

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

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:			

NGB-AVS-SG
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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:		

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

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.

BEST AVAILABLE COPY

Industrial Hygiene Survey

Massachusetts Army National Guard (MA ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Chicopee Readiness Center
371 Armory Drive
Chicopee, MA 01013-2960

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

Survey Date: July 28, 2010
Report Date: September 16, 2010

AEI Project #: J10-513 3a MA Chicopee RC

Non-Responsive
Industrial Hygienist

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List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Readiness Center located at 371 Armory Drive, Chicopee, MA, 01013-2960. Non-Responsive performed the evaluation on July 28, 2010. The point of contact for the facility was Sgt. 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) evaluations of operations including operation description, sampling for chemicals or particulates if appropriate, 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; potential ergonomic problems; hazardous material storage; and housekeeping practices; (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated concerns the following :

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.

Lead in Air Samples: Results of collected air samples were below regulatory limits for lead (50 $\mu g/m^3$).

Paint Chip and Wipe Samples for Lead Contamination: One sample collected from the top of a vending machine in the Assembly Hall and three samples collected from the former firing range were above the National Guard criteria for lead contamination (200 $\mu g/ft^2$).

Visual Inspection for Damaged Asbestos-Containing Materials: No damaged suspect asbestos-containing materials were observed at the Chicopee Readiness Center.

Visual Inspection for Water Damage and Mold Growth: No visual evidence of water damage or mold growth was observed in the facility.

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: The evaluation indicated that there are some illumination deficiencies in two offices in the facility. The illumination measurements indoors ranged from a low of 13.2 foot candles (fc) to a high of 144.8 fc.

Indoor Air Quality: Temperatures and relative humidity measurements were outside the acceptable range in most of the facility. These results are not unexpected due to outdoor conditions on the day of the survey and the lack of air conditioning in most of the facility. Indoor levels of carbon monoxide ranged from 0 to 0.1 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Massachusetts Army National Guard (MA ARNG) Readiness Center located at 371 Armory Drive, Chicopee, MA 01013-2960. Non-Responsive performed the evaluation on July 28, 2010. The point of contact for the facility was SSG. 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 Chicopee Readiness Center is staffed with 4 administrative 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 Chicopee 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 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 Chicopee facility consist exclusively of supply and administrative duties. No maintenance of vehicles, painting of equipment or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer 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

Heat is supplied to the facility through a boiler located in the boiler room and overhead heaters in the drill hall. The boiler certificate for the Chicopee facility was expired and is not up to date. Any air conditioning provided to the building is through window air conditioning units. No local ventilation systems were present at 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 peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices. Lighting and indoor air quality measurements were taken in all areas of the facility as well.

Lead in Air Samples

To determine if any airborne contamination of lead existed in the facility, air sampling for lead was conducted in the Officer's Room and the Orderly's Room and analyzed with AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Lead in Air Sampling for the MA ARNG Chicopee Readiness Center on July 28, 2010.

Air Sample #	Sample Location	Result (µg/m³)*
CHI-01	Supply Office at Desk	5.5
CHI-02	Room 5 at Desk	5.4

*The OSHA PEL for Lead in Air is 50 µg/m³.

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 areas of peeling or flaking paint were 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 10cm x 10cm templates. Wipe samples for surface dust were collected in 17 locations. The Environmental Protection Agency (EPA) and the Commonwealth of Massachusetts limits for lead in dust are 40 micrograms per square foot (µg/ft²) on floors, 250 µg/ft² on window sills, and 400 µg/ft² 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 Center for Health Promotion and Preventive Medicine (USACHPPM) recommended maximum level for adult exposures of 200 µg/ft² on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to Aerosol Monitoring and Analysis Analytical Services, Inc. (AMA) for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Four wipe samples were above the National Guard criteria for lead contamination. A total of four wipe samples: one sample collected from the top of a vending machine in the Assembly Hall and three samples collected from the former firing range were above the National Guard criteria for lead

contamination (200 µg/ft²). Results are given in Table 2 and certificates of analysis are included in Appendix B.

Table 2 – Results of Dust Wipe Sampling for MA ARNG Chicopee Readiness Center on July 28, 2010.

Wipe Sample #	Sample Location	Result (µg/ft²)*
CHI-PB-01	Room 26, From Radiator Vent	130
CHI-PB-02	Kitchen, From Prep Table	<110
CHI-PB-03	Assembly Hall, Middle of Floor	<110
CHI-PB-04	Assembly Hall, On Top of Vending Machine	**250**
CHI-PB-05	Assembly Hall, On Table Against Wall to Mess Hall	<110
CHI-PB-06	Room 18, Former Indoor Firing Range, Light Fixture	**230**
CHI-PB-07	Room 18, Former Indoor Firing Range, Stored Boxes	<110
CHI-PB-08	Room 18, Former Indoor Firing Range, Floor	**210**
CHI-PB-09	Immediately Outside Room 18 on Floor	<110
CHI-PB-10	Room 18, Former Indoor Firing Range, From Ductwork	**3,200**
CHI-PB-11	Room 12, From Window Sill	<110
CHI-PB-12	Supply Room 13, Top of Refrigerator	<110
CHI-PB-13	Supply Room 17, From Storage Shelf	<110
CHI-PB-14	Room 22, Desktop by Door	<110
CHI-PB-15	Hallway 25, Middle of Floor	<110
CHI-PB-16	Room 26, Top of File Cabinet	<110
CHI-PB-17	Room 2, Top of Work Table	<110

*The US Army CHPPM recommends a maximum level for adult exposures of 200 µg/ft² lead on floors

Visual Inspection for Damaged Suspect Asbestos-Containing Materials

A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. No damaged suspect asbestos-containing materials were observed at the Chicopee Readiness Center.

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. There was no evidence of water damage or mold growth at the facility.

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

Illumination levels were measured using a Cal-Light 400L, calibrated on July 28, 2010, 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 RC. The evaluation indicated that there are some illumination deficiencies in two offices. The illumination measurements indoors ranged from a low of 13.2 foot candles (fc) to a high of 144.8 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination. Additional illumination can be achieved by replacing burned-out lamps, cleaning fixtures, relocating detailed work to more illuminated areas, using supplemental task lighting, and opening doors or windows to provide more natural lighting.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a factory calibrated TSI Q-Trak Plus Model 7565-X. 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) 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 55-2004. 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 55-2004

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 84.1 to 87.2º F and 40.6 to 66.9% Rh. Outdoor temperature and humidity measurements were 84.2° F and 56.6% on the day of monitoring. Temperatures and relative humidity measurements were outside the acceptable range in most of the facility. These results are not unexpected due to outdoor conditions on the day of the survey and the lack of air conditioning in most of the facility. Those areas with window air conditioning units were within acceptable ranges.

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 – 2007 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 333 to 601 parts per million (ppm) and outdoor CO_2 levels were approximately 519 ppm during the monitored period. CO_2 measurements were below the guideline in all areas, indicating adequate fresh air exchange.

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 62.1-2007 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 to 0.1 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, peeling lead-based paints, the presence of damaged suspect asbestos-containing materials, noise hazards, visible mold and housekeeping. The results of the evaluation indicated industrial hygiene concerns in the following areas: cross contamination from the former firing range, indoor air quality, and lighting. Overall, Chicopee Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees.

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.

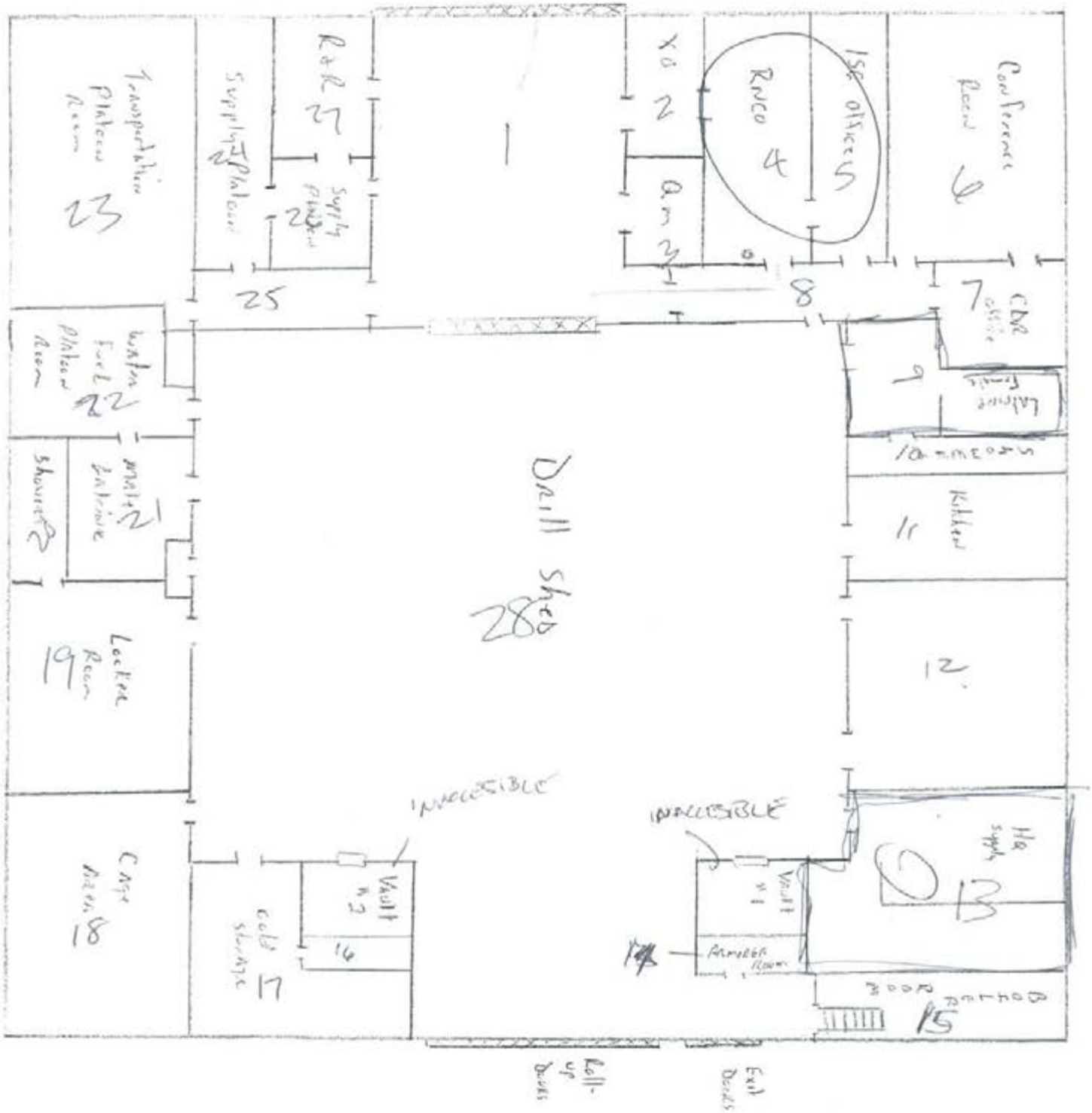
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential 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, sate, 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, August 23, 2007.
6. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 15, 1998.
7. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
8. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
9. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
10. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
11. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2007, “Ventilation for Acceptable Indoor Air Quality” and Standard 55-2004, “Thermal Environmental Conditions for Human Occupancy”.
12. NIOSH website: http://www.cdc.gov/niosh/
13. OSHA website: http://www.osha.gov/.
14. Army CHPPM website: http://chppm-www.apgea.army.mil/.
15. EPA website: http://www.epa.gov.

Appendix A
Building Layout



Appendix B
Certificates of Analysis for Air, Dust Wipe and Bulk Samples

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

NY ELAP 10920

Client:	National Guard Bureau	**Job Name:**	Chicopee Armory	**Chain Of Custody:**	508464		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Chicopee,MA	**Date Submitted:**	8/2/2010		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/6/2010	**Report Date:**	8/6/2010

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
1066319	CHI-01	Flame	Air	549	N/A	5.5	ug/m³	<3	<5.5	ug/m³	
1066320	CHI-02	Flame	Air	557	N/A	5.4	ug/m³	<3	<5.4	ug/m³	
1066321	CHI-Pb-01	Flame	Wipe	****	0.108	110	ug/ft²	14	130	ug/ft²	
1066322	CHI-Pb-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066323	CHI-Pb-03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066324	CHI-Pb-04	Flame	Wipe	****	0.108	110	ug/ft²	27	250	ug/ft²	
1066325	CHI-Pb-05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066326	CHI-Pb-06	Flame	Wipe	****	0.108	110	ug/ft²	24	230	ug/ft²	
1066327	CHI-Pb-07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066328	CHI-Pb-08	Flame	Wipe	****	0.108	110	ug/ft²	23	210	ug/ft²	
1066329	CHI-Pb-09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066330	CHI-Pb-10	Flame	Wipe	****	0.108	110	ug/ft²	340	3200	ug/ft²	
1066331	CHI-Pb-11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066332	CHI-Pb-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066333	CHI-Pb-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066334	CHI-Pb-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066335	CHI-Pb-15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066336	CHI-Pb-16	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
1066337	CHI-Pb-17	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

NY ELAP
10920

Client:	National Guard Bureau	**Job Name:**	Chicopee Armory	**Chain Of Custody:**	508464		
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Chicopee,MA	**Date Submitted:**	8/2/2010		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	8/6/2010	**Report Date:**	8/6/2010

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)-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) 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 sampes.

NY ELAP accreditation applies only to paint chip, wipe, and soil samples.

Analys Non-Responsive

Technical Manager: Non-Responsive

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) **508464**

PV2

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: CHICOPEE ARMORY
2. Job Location: CHICOPEE MA
3. Job #:
4. Contact Per
5. Submitted

PO #: W912K6-09-A-0003

Non-Responsive

Reporting Information (Results will be provid

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:
☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ Emai Non-Responsive us.army.mil
☐ Fax:
☐ 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 (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 CHEST) 17 (QTY)
☒ Pb Air 2 (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	SWAB	TAPE	STORE TRAP	WATER AND OTHER	CLIENT CONTACT (LABORATORY STAFF ONLY)
CHI-01		7/28/10	548.8					X		X							Date/Time: Contact: By:
CHI-02			557.2							X							
CHI-PB-01				10x10 cm								X					
CHI-PB-02																	
CHI-PB-03																	Date/Time: Contact: By:
CHI-PB-04																	
CHI-PB-05																	
CHI-PB-06																	
CHI-PB-07																	Date/Time: Contact: By:
CHI-PB-08																	
CHI-PB-09																	
CHI-PB-10																	

Non-Responsive

LABORATORY STAFF ONLY:
1. Date/Time RCVD: 8/2/10 @ 1030 Via: FedEx By (Print):
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: D
4. Comments:

CUSTODY)

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) 595464

P2D

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: CHICOPEE ARMORY
2. Job Location: CHICOPEE MA
3. Job #:
4. Contact Person: Non-Responsive 2-0273
5. Submitted by:

Reporting Information (Results will be provided a

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due:	❑ Immediate ❑ 3 Day	☒ Include COC/Field Data Sheets with Report
❑ 24 Hours Time Due:	❑ Next Day ❑ 5 Day +	☒ Email: Non-Responsive @us.army.mil
Comments:	❑ 2 Day Date Due:	❑ Fax:
	❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	❑ 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 (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) (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	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
CH1-PB-11		7/28/10		10400				X				X					Date/Time: Contact: By:
CH1-PB-12		↓		↓				↓				↓					
CH1-PB-13																	
CH1-PB-14																	
CH1-PB-15																	Date/Time: Contact: By:
CH1-PB-16																	
CH1-PB-17																	
																	Date/Time: Contact: By:

Non-Responsive

LABORATORY STAFF ONLY: CUSTODY
1. Date/Time RCVD: / / @ Via: By (Print):
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

Appendix C
Photo Documentation

Chicopee RC

Mess Hall

Kitchen

Drill Hall

Boiler Room

Chicopee RC

Storage Area

Storage Area, Former Firing Range

Locker Room

Conference Room

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	**Chicopee**	IAQ							Light		
Date		Inspector	Non-Responsive	Instrument		Q-TRAK 7565-X					Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		7565X0839017					Serial Number		K070277
Weather Conditions				Last Calibration		Sep-08					Last Calibration		30-Jul-09
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Value (fc)
1	Entry		1:10 PM	85.6	X	52.0	X	352		0.0		46.8		10
2	Office		1:11 PM	85.7	X	54.4	X	390		0.0		94.4		50
3	Office		1:12 PM	84.3	X	48.6	X	582		0.0		29.2	X	50
4	Office		1:13 PM	84.7	X	53.2	X	449		0.0		55.0		50
5	Office		1:14 PM	84.8	X	53.0	X	408		0.0		43.6	X	50
6	Conference Room		1:15 PM	85.1	X	54.6	X	395		0.0		64.4		30-50
7	Office		1:16 PM	85.3	X	54.0	X	413		0.0		144.8		50
8	Hall		1:17 PM	85.4	X	66.2	X	601		0.0		16.6		5
9	Women's Room		1:20 PM	86.0	X	54.8	X	569		0.0		13.2		5
10	Shower		1:21 PM	86.1	X	56.6	X	421		0.0		29.4		5
11	Kitchen		1:26 PM	87.0	X	49.5	X	333		0.0		98.7		50
12	Mess Hall		1:27 PM	87.2	X	50.4	X	360		0.1		105.7		5-50
13	Supply Office		1:30 PM	87.2	X	49.6	X	383		0.0		64.4		50
14	Armorer's Office	Inaccessible												
15	Boiler Room		1:37 PM	86.8	X	50.7	X	373		0.0		71.7		30
16	Storage		1:40 PM	85.5	X	52.9	X	367		0.0		73.8		5-30
17	Storage		1:41 PM	84.9	X	54.4	X	413		0.0		35.9		5-30
18	Storage		1:44 PM	84.1	X	52.9	X	359		0.0		71.8		5-30

Notes:

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°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

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	MA	City	**Chicopee**	IAQ								Light		
Date		Inspector	Non-Responsive	Instrument		Q-TRAK 7565-X						Instrument		CAL-LIGHT 400
Facility Description	**Readiness Ctr**			Serial Number		7565X0839017						Serial Number		K070277
Weather Conditions				Last Calibration		Sep-08						Last Calibration		30-Jul-09
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference Value (fc)
19	Locker Room		1:47 PM	85.8	X	50.1	X	377		0.0		20.2		7
20	Shower		1:52 PM	83.4	X	53.5	X	387		0.0		62.6		5
21	Men's Room		1:55 PM	83.6	X	55.8	X	368		0.0		15.8		5
22	Office		2:01 PM	83.5	X	56.1	X	419		0.0		128.7		50
23	Conference		2:03 PM	83.5	X	55.5	X	431		0.0		120.5		30-50
24	Office		2:04 PM	83.5	X	56.4	X	356		0.0		55.1		50
25	Hall		2:05 PM	83.7	X	56.6	X	412		0.0		18.8		5
26	Office		2:07 PM	84.3	X	66.9	X	450		0.0		106.1		50
27	Office		2:09 PM	83.6	X	40.6	X	492		0.0		119.4		50
28	Assembly Hall		2:12 PM	84.2	X	56.6	X	519		0.0		48.2		30-50

Notes:

Relative Humidity	Winter Temp.	Summer Temp.
30%	68.5°F-76.0°F	74.0°F-80.0°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

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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
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
371 ARMORY DRIVE
CHICOPEE, MA 01013

July 11, 2013
PN: 39743799

Non-Responsive

Director, Industrial Hygiene Services

Non-Responsive

Project Manager

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TABLE OF CONTENTS

APPENDICES

FINDINGS AND RECOMMENDATIONS
MASSACHUSETTS NATIONAL GUARD READINESS CENTER
371 ARMORY DR., CHICOPEE, MA

Findings	Recommendations	Risk Assessment Code (RAC)
Lighting		
On the day of the survey, the illuminance was inadequate in several locations tested.	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, arm rests 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		
One of the 10 lead wipe samples indicated elevated lead levels.	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
Emergency Exits		
Emergency exit signs and escape plans were not visible from all areas of the facility or illuminated.	Emergency exits should be properly illuminated (29 CFR 1910.37 (q)(6)).	RAC 3
A shelving unit was blocking a doorway.	Exits must be readily accessible at all times (29 CFR 1910.37 (f)(1)).	RAC 3
Asbestos		
Presumed asbestos-containing floor tiles and associated mastic were observed; an Asbestos Operation and Maintenance Program was not available on-Site.	Develop a site-specific asbestos operations and maintenance program for management of asbestos-containing materials in place as required by OSHA 29 CFR 1910.1001(j)(2).	RAC 4
Personal Protective Equipment		
Hazard assessments have not been conducted to determine whether personal protective equipment is 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 4

Findings	Recommendations	Risk Assessment Code (RAC)
Fire Extinguishers		
No evidence was found that all fire extinguishers were being inspected on a monthly basis.	All fire extinguishers must be inspected on a monthly basis to determine that they are full and readily accessible (OSHA 29 CFR 1910.157(e)(2))	RAC 3
Chemical Storage		
Chemicals and flammables were improperly stored in the Storage/ Supply areas.	Each container of hazardous chemicals in the work place must be labeled with the identity of the chemical and appropriate hazard warnings (29 CFR 1910.1200).	RAC 4
Housekeeping		
Storage areas and passageways were found to be somewhat cluttered at the time of URS' site visit.	All places of employment, passageways, storerooms and service rooms shall be kept clean and orderly and in a sanitary condition (29 CFR 1910.22 (a)(1))	RAC 4
Hazard Communication		
No written hazard communication program was identified on site.	Employers shall develop, implement and maintain a written hazard communication program (29 CFR 1910.1200 (e)(1)).	RAC 3
Temperature		
The average temperature in the Readiness Center was above the recommended level.	Temperature should be maintained between 68 to 75 °F for worker comfort (ASHRAE 55-2010).	

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 Readiness Center in Chicopee, Massachusetts.

URS representative, Ms. Non-Responsive, conducted the Industrial Hygiene Survey on May 22, 2013. 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 monitoring.

The Chicopee Readiness Center is a one-story brick building, consisting of offices, a classroom/mess hall, a PT room, a supply area, gender separate bathrooms, an Assembly Hall and locker rooms. A layout of the Readiness Center is provided in Appendix A.

GENERAL: No evidence was found that fire extinguishers are being inspected on a monthly basis and some were missing inspection tags. Emergency exit signs and escape plans were not posted throughout the facility. A shelving unit was blocking a doorway. Chemicals and flammables were not properly labeled and stored.

LIGHTING: Lighting in the Readiness Center was found to be inadequate in several of the areas measured. Areas noted within the report as having inadequate lighting require upgrading by either increasing the general lighting or through the use of task lighting. While work is in progress work areas must be lighted by at least the minimum light intensities.

LEAD: One of the ten wipe samples collected in the Readiness Center were found to contain lead in a concentration above the recommended limit set by the NGB, Region North IH Office.

ASBESTOS: Presumed asbestos-containing floor tiles and associated mastic were identified during this survey. Until suspect materials have been sampled and determined

not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

ERGONOMICS: Many of the work stations had ergonomic issues which require attention. 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, keyboards, and monitors were not adjustable. All workstations in the facility should be adjusted and monitored. The ergonomic issues with regard to the workstations and chairs need to be corrected by fitting the workplace to the worker.

NOISE: Noise monitoring levels in the Readiness Center determined that noise levels were below the OSHA permissible exposure limit (PEL) and Department of Defense Instruction (DoDI) Hearing Conservation Standard (6055.12 3 December 2010) on the day of URS' site visit.

2.0 SUPPLY / TRAINING AREA

2.1 Operation Description

This Readiness Center is primarily used for weekend training drills and conducting administrative functions. The building includes offices, a classroom/mess hall, a PT room, a supply area, gender separate bathrooms, an Assembly Hall and locker rooms.

The Readiness Center was found to be neat and organized at the time of URS' site visit.

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 Readiness Center. Interior carbon dioxide concentrations were found to be between 443 and 600 parts per million (ppm). Carbon dioxide levels were measured using a direct-reading TSI Q-Trak (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 but is typically 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 403 ppm. Therefore ASHRAE (Standard 62.1-2010) would recommend that interior carbon dioxide concentrations be maintained at or below 1,103 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 concentrations in the Readiness Center were measured ranged from 0.1 ppm and 0.8 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-Trak 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.

2.2.3 Relative Humidity

The average relative humidity within the Readiness Center measured with the Q-Trak Plus was 47.9%, which was within the guideline of less than 65% recommended by ASHRAE.

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.

The average temperature inside the Readiness Center was, 79.6 °F, which was above the guideline of 68 to 75 °F recommended by ASHRAE for thermal comfort. URS received several complaints regarding elevated indoor temperature during this survey.

2.2.5 Lighting

Lighting in the Readiness Center 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 in Foot Candles (FC)	Recommended Minimum Illuminance in Foot Candles (FC)
Office, desk- [redacted]	Admin	70.5	50
Office, desk- [redacted]	Admin	104.8	50
Office, desk- [redacted]	Admin	56.9	50
Office, vacant desk	Admin	70.9	50
Training Room, vacant desk	Admin	**42.8**	50
Training Room, vacant desk, north corner	Admin	57.1	50
Training Room, vacant desk	Admin	101.6	50
Rear Hallway	Hall	10.5	5
Office, desk- [redacted]	Admin	**39.3**	50
Office, vacant desk	Admin	93.1	50
Classroom, table	Admin	82.0	50
Admin Hallway	Hall	11.9	5
Copy/ Mail Room	Admin	52.9	30
Hallway, by Room 101	Hall	36.8	5
Training Room 2133	Admin	**36.1**	50
Hallway	Hall	53.4	5
Main Hallway	Hall	70.8	5
Main Hallway	Hall	26.1	5

On the day of the survey, the illuminance in the Readiness Center was determined to be inadequate in three of the locations surveyed.

2.2.6 Lead

Wipe testing for lead dust was conducted in the Readiness Center 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 Readiness Center

Sample Location	URS Sample Number	Area Wiped in Square Feet (ft^2)	Result in Micrograms/ Square Foot ($\mu g/ft^2$)	Maximum Surface Contamination Level in Micrograms/ Square Foot ($\mu g/ft^2$)
Office, top of shelving unit adjacent to TV	Chicopee RC W-01	0.108	<110	200
Office, top of shelf adjacent to window	Chicopee RC W-02	0.108	<110	200
Office, under shelving unit, across from desk	Chicopee RC W-03	0.108	<110	200
Northeast office, corner adjacent to desk and window	Chicopee RC W-04	0.108	<110	200
Office, under desk, to women's restroom	Chicopee RC W-05	0.108	<110	200
Loading area, west of loading area	Chicopee RC W-06	0.108	**3,400**	200
Hallway by Room 102, adjacent to Room 102 doorway	Chicopee RC W-07	0.108	<110	200
PT Room, adjacent to pipe and window and machine	Chicopee RC W-08	0.108	<110	200
Main Hall, south side, under crate	Chicopee RC W-09	0.108	130	200
Classroom, behind doorway, north side	Chicopee RC W-10	0.108	<110	200

One of the ten surface dust level measurements were found to contain lead at a level above the NGB recommended level, based on the OSHA clarification letter which states "as free as practicable" of lead contamination as specified under OSHA 29 CFR 1926.62.

No areas of peeling paint were identified for sample collection during this survey.

2.2.7 Asbestos

No damaged, friable suspect materials were identified for sample collection during this survey.

Presumed asbestos-containing floor tiles and associated mastic were also identified during this survey. Until suspect materials have been sampled and determined not to contain asbestos, they must be presumed to be asbestos-containing and managed accordingly.

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, window air conditioning units) within the majority of rooms, and main negative draw fans in the Assembly Hall.

2.4 Noise Measurements

Area noise dosimetry was conducted within the administrative office area. Noise exposures were measured using a data-logging Spark 703+ Noise Dosimeter. Area noise dosimetry results indicated that, on the day of the survey, workers were not exposed to noise levels above the DoDI Hearing Conservation Standard (6055.12 3 December 2010) of 85 decibels, A scale (dBA)/8-hour day. Table 2-5 indicates the individual monitored, the tasks performed and noise exposures.

Table 2-5
Noise Dosimetry Data

Location	Task	Sample Duration in Minutes	Monitoring Result TWA (dBA)*	Hearing Protection
Office- Non-Responsive	Administrative	364	64.0	N/A

* The calculated 8-hour, time-weighted average (TWA) noise exposure in dBA. The OSHA PEL for noise exposure is 90 dBA. DoDI 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 Readiness Center. Personal protective equipment included ear plugs and nitrile gloves. No personal protective equipment was observed in use during URS' site visit.

3.0 SAFETY AND INDUSTRIAL HYGIENE PROGRAMS

3.1 Confined Spaces

A written confined spaces program is not required for this site.

3.2 Hearing Conservation

A written hearing conservation program was not identified on site. A review of normal site activities determined that no operations were identified that would warrant hearing protection. Based on area noise dosimetry results, a hearing conservation program is not required for this site.

3.3 Respiratory Protection

A site-specific written program regarding Respiratory Protection was not identified on site. No operations were observed by URS that would require the use of respiratory protection.

3.4 Hazard Communication

A site-specific hazard communication program was not identified on site.

Material safety data sheets, a site map, and list of full time personnel were readily available on the day of the survey.

3.5 Personal Protective Equipment

A written personal protective equipment program was not identified on site. A hazard assessment should be conducted to determine whether personal protective equipment is required for activities typically undertaken at the Readiness Center.

3.6 Asbestos Operations and Maintenance Program

A written asbestos operations and maintenance program was not identified on site.

3.7 Safety

No evidence was found that fire extinguishers are being inspected on a monthly basis and some were missing inspection tags. Emergency exit signs and escape plans were not posted throughout the facility. A shelving unit was blocking a doorway. Flammable materials were not properly stored.

4.0 REFERENCES

American Conference of Governmental Industrial Hygienists

Industrial Ventilation: A Manual of Recommended Practice, 27th Edition, 2010

Guidelines for the Assessment of Bio-aerosols in the Indoor Environment, 1989

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, 14 April 2008

DA PAM 40-501, Hearing Conservation Program, 10 December 1998.

AR 385-10, The Army Safety Program, 23 August 2007; RAR Issue Date: 4 October 2011

National Guard Pamphlet 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006

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

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, 13 January 2003.

APPENDIX A

SHOP DRAWING