National Guard Bureau
Mid-West Regional Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

ARNG-CSG-P January 14, 2015

MEMORANDUM FOR: The Adjutant General for Iowa

SUBJECT: Industrial Hygiene Survey at Boone Armory, Boone, Iowa

At the request of the National Guard Bureau (NGB) Mid-West Regional Industrial Hygiene (IH) Office, Non-Responsive, Certified Industrial Hygienist (CIH), conducted a survey on December 4, 2014 at the Iowa Army National Guard Boone Armory, 700 Corporal Roger Snedden Drive, Boone, Iowa. The site point of contact was Non-Responsive.

The NGB conducted this survey in the interest of preventing employee illness and in meeting legal obligations where applicable. Based on information provided, every effort was made to conduct a comprehensive survey covering the parameters considered. Results and recommendations are based on information provided by site personnel, field measurements, and conditions observed during the survey. Changes in work practices and/or processes may change employee exposure levels. Use of different materials may result in exposure to a different air contaminant.

Occupational health risk assessment codes (RACs) are assigned to quantify health risks to personnel in accordance with DOD Letter of Instruction 6055.1, *DOD Safety and Occupational Health Program*. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. RAC descriptors are as follows: 1 = Critical, 2 = Serious, 3 = Moderate, 4 = Minor, and 5 = Negligible.

The Boone Armory was built in 1964. The armory is the base of operations for HHC; 248th Aviation Support Battalion; and Detachment 1 Alpha Company 168th. During the week, most of the activities at the armory involve administrative work. Site personnel reported that vehicle maintenance activities are mostly limited to fluid checks and tire changes on drill weekends, and that no major vehicle maintenance is performed at the armory. No vehicle maintenance was performed on the day of the survey. The Boone Armory had an indoor firing range (IFR) that was closed prior to 1990 and converted to offices. Weapons may be cleaned in the vault, in the supply room, or on tables set up on the drill floor.

The armory is available for rental for community activities that include: auctions, weddings, parties, and middle school basketball and wrestling practice. The industrial hygiene survey included a walkthrough of the facility and interviews with employees.

Wipe samples were collected on representative surfaces in the facility and analyzed for lead. For purposes of this report, any results that exceed the guidelines adopted by the NGB Mid-West Regional IH Office are considered significant. None of the surface wipe sample results exceeded the guideline for lead. The following actions are required:

- **Clean the horizontal surfaces where lead may be present using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).**

- **Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).**
- **When weapons are cleaned, special attention should be given to cleaning up the work area to prevent potential lead contamination from ammunition (RAC 2).**

For any further questions, please contact Non-Responsive call at 303 210-8722.

Non-Responsive

Non-Responsive

Regional Industrial Hygienist

Appendix	Title	Status
A.	Lead – Wipe Sampling	Attached

Appendix A
Lead – Wipe Sampling

Surface Area Wipe Samples

Wipe samples were collected from representative areas of the facility using Environmental Express Ghost™ Wipes and templates in accordance with the OSHA wipe sampling method (OSHA Technical Manual, Appendix II, 2-1). In addition, surface wipe samples were collected in the kitchen to assess migration of lead into food handling spaces. The Boone Armory had an indoor firing range (IFR) that was closed prior to 1990 and converted to offices. Wipe samples were also collected in the former IFR areas. The samples were analyzed for lead by OSHA Method ID-121. The results and photos are contained in Table A-1.

The Occupational Safety and Health Administration (OSHA) requires that all surfaces must be kept as free as practicable of accumulations of toxic metal dusts (29 CFR 1910). In addition, DOD has instituted a new policy to minimize surface contamination levels of heavy metals (*Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations*, DTM 12-003, 18 April 2012).

The NGB Mid-West Regional IH Office has adopted the guidelines for metal dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges* and the Department of Energy (DOE)/ Brookhaven National Laboratory (BNL) *Surface Wipe Sampling Procedure* (IH75190). Any results that exceed these guidelines, which are shown in Table A-1, are considered significant. None of the surface wipe sample results exceeded the guideline for lead.

Table A-1
Surface Area Wipe Sampling Results for Lead
Iowa Army National Guard
Boone Armory
Boone, Iowa
December 4, 2014

Sample #	Location	Photo	Lead ($\mu g/ft^2$)
Surface Guideline			**200**
IABNW1	Vault 1-1, on floor		93
IABNW2	Room 185-1, Locker room, center on floor		<10

Sample #	Location	Photo	Lead (µg/ft^2)
Surface Guideline			**200**
IABNW3	Room 126A-2, Audiometric test room, former IFR, midrange on floor		<10
IABNW4	Room 126C-2, Classroom, former IFR, at bullet trap area on floor		<10
IABNW5	Kitchen, on counter top		<10
IABNW6	Field blank	N/A	ND

Notes: 1) µg/ft^2 = micrograms per square foot of surface area. 2) ND = none detected. 3) "<" means less than the reporting limit for the analytical method.

Recommendations:

1. Clean the horizontal surfaces where lead may be present by using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).

2. Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).

3. When weapons are cleaned, special attention should be given to cleaning up the work area to prevent potential lead contamination from ammunition (RAC 2).

Laboratory Result Reports and Chain of Custody Sheets

FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: CDR Non-Responsive

Submitted By: Non-Responsive

Reference Data: Lead
Sampling Site: NGB: Boone, IA (Armory)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 12533
DFOH Lab Nos.: TM-15-76154 through TM-15-76159
Date Received: 12/10/14
Data Analyzed: 12/11/14 – 12/12/14
Date Issued: 12/16/14

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

Non-Responsive
Technical Manager

Non-Responsive
Laboratory Director

AIHA LAP, LLC
ACCREDITED LABORATORY

FOH ENVIRONMENTAL LABORATORY
636 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IABNW1	TM-15-76154	93	93
IABNW2	TM-15-76155	<10	<10
IABNW3	TM-15-76156	<10	<10
IABNW4	TM-15-76157	<10	<10
IABNW5	TM-15-76158	<10	<10
IABNW6**	TM-15-76159	<10	

Surface Wipe Sampling Criteria

Metal	Acceptable Surface Level µg/ft²	Basis for Criteria
Lead	250	EPA TSCA 40 CFR 745 and HUD Window Sills

Metals in Wipe Limits
(based on one ft² sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead	OSHA ID-121	5.0 µg/ft²	10 µg/ft²

Non-Responsive

Technical Manager

AIHA LAP, LLC
ACCREDITED LABORATORY

Project 12533
Page 2 of 2

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434
Attn: Michelle Stemmons

PROJECT REFERENCE
Agreement No.: A 106641
Statement of Work No.: S 184441
Project No: P 184442
Agency: EAARNG
Proj. Manager:
Location (City, State): Boone Armory Boone, IA

For Lab Use Only
Project /Report #: 12533
Due Date: 12/17/14
Samples Received Chilled? YES / NO (circle one)
Conditions on Receipt with Name & Date

Contact Information
Name: Non-Responsive
Address: USAH 3097 Priscilla Ave Highland Park, IL 60035
Phone: Non-Responsive
Email:

Water Sample Codes[3]
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes[4]
STD- Standard
3D- Three Day Rush[@]
WH Weekend/Holiday*

Analysis Requested
Lead

Sample ID #	Type*	Media[1]	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code[7]	Turn Around Time*	Lab ID #
IABNW1	7	5	12/4/14						1				TM-15-76154
2													76155
3													76156
4													76157
5													76158
6					Field blank				-				76159

Sample Type Codes[1]
1-Air, 2-Water, 3-Paint, 4-Soil, 5-Dust, 6-Bulk, 7-Wipe, 8- Other

Sample Media Codes[1]
1-Charcoal, 2-Matched Weight, 0.8um, 3-PVC filter, 4-MCE 0.8 um, 37 mm, 5-Ghost Wipes™, 6- Passive badge, 7- Other

Non-Responsive

Date & Time: 12/10/14

COMMENTS: wipes are 1 square foot

* Applied to organic and inorganic analysis in cases of an emergency only. @ Applied to inorganic and organic samples. SD: Applied to organic and inorganic samples 7-10 business days.

Surface Lead Monitoring Survey

At

Iowa Army National Guard
Readiness Center - Armory
Boone, Iowa

Survey date: April 23, 2013

For

Department of the Army
National Guard Bureau
Region West Industrial Hygiene Office
NGB-AVN-S1

Performed by

U.S. Public Health Service
Federal Occupational Health
Denver, Colorado

June 20, 2013

Table of Contents

Appendices

I. Executive Summary

At the request of the National Guard Bureau Region West Industrial Hygiene Office, field personnel representing the U.S. Public Health Service, Federal Occupational Health conducted surface lead monitoring at the Iowa Army National Guard Army, Boone Armory located in Boone, Iowa. This survey was conducted in order to identify lead levels on surfaces within the facility.

A firing range was located in the building but it is closed and the area renovated into offices. Weapons are cleaned in the Drill room. The Drill room is available to the public for special events such as wedding receptions, yard sales, and banquets. Children are present at some of the events.

Nine surface wipe samples were collected and analyzed for lead contamination in the facility. Eight of the samples were below the NGB Industrial Hygiene recommended surface limits of 40 ug lead/ft^2 for areas occupied by children and 200 ug lead/ft^2 for areas occupied by Guard personnel. One sample collected in the Drill room on the upper window sill contained 76 ug/ft^2 of lead dust.

Since children are allowed into the Drill room several times per year, all surfaces within the Drill room should have surface lead levels below 40 ug/ft^2. The dust layer on the window sill can be disturbed by air movement resulting in dust being deposited on the Drill room floor. The upper surfaces in the Drill room need to be cleaned to prevent lead exposure to the public. (RAC 2)

II. Introduction

Monitoring of lead on workplace surfaces was conducted by the U.S. Public Health Service (USPHS) Federal Occupational Health (FOH) at the Iowa Army National Guard Army, Boone Readiness Center (armory) located in Boone, Iowa. This work was conducted under the Interagency Agreement between the USPHS, FOH and the West Region of the Army National Guard. Non-Responsive, Certified Industrial Hygienist, conducted this survey on April 23, 2013.

The purpose of the site visit was to collect surface wipe samples in the building for the evaluation of lead contamination. FOH conducted this survey in the interest of preventing employee illness and in meeting legal obligations where applicable. Based on information provided, every effort was made to conduct a comprehensive survey covering the parameters considered. Results and recommendations are based on information provided, field measurements, and conditions observed during the survey.

III. Site Description

The Readiness Center (armory) was built in 1964 and consists of a drill room or assembly hall, offices, classrooms, locker room, kitchen, and break room. There was a firing range in the building but it is closed and the area renovated into classrooms. Weapons are cleaned in the drill room. The drill room is available to the public for special events such as wedding receptions, yard sales, and banquets. Children are present at some of the events.

IV. Assessment Criteria

NBG Industrial Hygiene has adopted the sampling procedures and recommended limits for lead dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion on Indoor Firing Ranges*, November 3, 2006. For purposes of this report, any surface lead level that exceeds 200 micrograms per square foot (ug/ft^2) in the facility is considered significant. NG Pam 420-15 may be found at: http://www.ngbpdc.ngb.army.mil/pubs/420/ngpam420_15.pdf.

Also, the NGB-ARS Memorandum for the Chiefs of Staff dated February 2, 2006 provides guidance for potential lead hazard exposure in Army National Guard child occupied facilities. The memorandum defines a child occupied facility as a building, or portion of a building, visited on a regular basis by the same child, six years of age or under. Child occupied facilities may include, but are not limited to, day-care centers, preschools, and kindergarten classrooms. The memorandum states that, “For all areas used/occupied on a regular basis by children ages six and under clean all floors accessible to said children to the EPA dust-lead standard of 40 ug/ft^2. For purposes of

this report any surface lead level that exceeds 40 ug/ft^2 in a child occupied area is considered significant.

V. Findings, Discussion, and Recommendations

Wipe Sampling Method

Surface samples were collected using Environmental Express Ghost Wipes. Surface wipe templates that encompassed either 1 square foot (child occupied areas) or 0.11 square foot (other work areas) of surface area were used to collect samples. For each surface sample collected, a new set of gloves and a new numbered template was used. The entire template area was wiped using an "S" configured motion. The wipe was then folded in half and the template area was wiped using an "S" motion in a direction perpendicular to the first. The wipe was folded again and the perimeter of the area was wiped. The wipe was placed into a plastic tube, capped, and the samples were sent to the FOH Laboratory in Chicago, Illinois. Samples were hot plate digested and analyzed for lead with a Perkin Elmer 200 fame atomic absorption spectrophotometer using the OSHA ID-121 Analytical Method.

Surface Wipe Samples

Nine surface wipe samples were collected and analyzed for lead contamination in the facility (Figures 1 - 8). Eight of the samples were below the NGB Industrial Hygiene recommended surface limits of 40 ug lead/ft^2 for areas occupied by children and 200 ug lead/ft^2 for areas occupied by Guard personnel. One sample collected in the Drill room on the upper window sill (Figure 6) contained 76 ug/ft^2 of lead dust. The results are contained in Table 1.

Table 1
Area Wipe Sampling Results for Lead
Iowa Army National Guard
Boone Armory
April 23, 2013

Sample Number	Location	Lead ug/ft^2
1	Drill Floor on floor	<10
2	Drill Floor on floor outside vault	<10
3	Kitchen on ice machine	<10
4	Room 126 A-2 on hearing booth	<91
5	Room 126 B-1 on desk	<91
6	Hallway on snack vending machine	<91
7	Drill Floor on upper window sill	**76**
8	Break room 176 on microwave	<91
9	Break room on refrigerator	<91
10	Blank	ND

Note: 1) ug/ft^2= micrograms per square foot of surface area. 2) **Bold** indicates that concentration was "significant."

Recommendations

Since children are allowed into the Drill room several times per year, all surfaces within the Drill room should have surface lead levels below 40 ug/ft^2. The dust layer on the window sill can be disturbed by air movement resulting in dust being deposited on the Drill room floor. The upper surfaces in the Drill room need to be cleaned to prevent lead exposure to the public. (RAC 2)

Figure 1 – Wipe sample 1

Figure 2 – Wipe sample 2

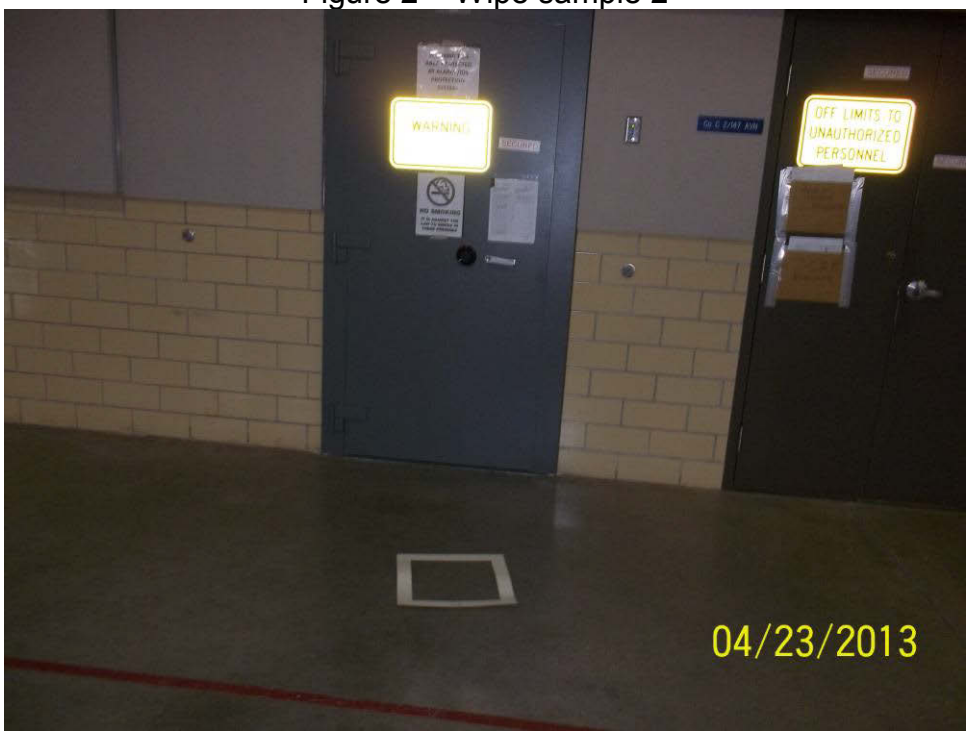


Figure 3 – Wipe sample 3

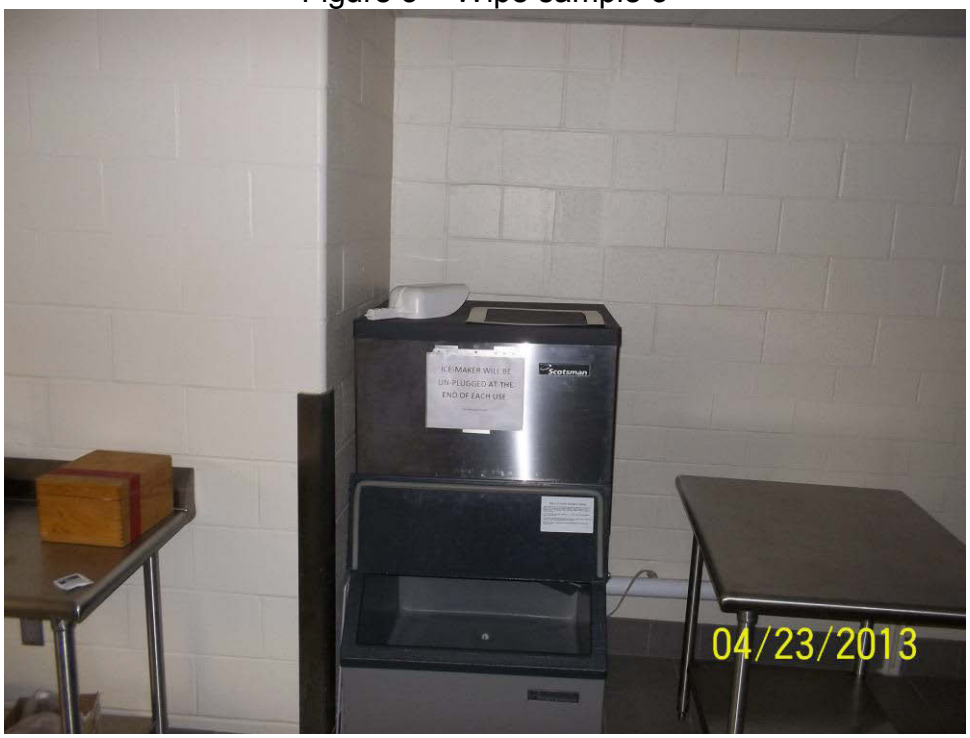


Figure 4 – Wipe sample 5

Figure 5 – Wipe sample 6

Figure 6 – Wipe sample 7

Figure 7 – Wipe sample 8

Figure 8 – Wipe sample 9

Technical Assistance: This report was written by Non-Responsive as a representative of FOH, USPHS. Non-Responsive, Regional Industrial Hygienist at the NGB Region West Industrial Hygiene Office, reviewed and approved this report. For technical assistance regarding information found in this report or the performed survey, please contact Non-Resp

Reviewed by:

Non-Responsive
Non-Responsive

Appendix A

Iowa Army National Guard State Points of Contact

MAJ Non-Responsive

Armory Point of Contact

Non-Responsive

Appendix B

FOH ENVIRONMENTAL LABORATORY

536 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead
Sampling Site: NGB: Boone, IA (Armory)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 11112
DFOH Lab Nos.: TM-13-61014 through TM-13-61023
Date Received: 05/07/13
Data Analyzed: 05/10/13 - 05/13/13
Date Issued: 05/16/13

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at Non-Responsive

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

FOH ENVIRONMENTAL LABORATORY

536 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
1	TM-13-61014	<10	<10
2	TM-13-61015	<10	<10
3	TM-13-61016	<10	<10
4	TM-13-61017	<10	<91
5	TM-13-61018	<10	<91
6	TM-13-61019	<10	<91
7	TM-13-61020	76	76
8	TM-13-61021	<10	<91
9	TM-13-61022	<10	<91
10**	TM-13-61023	<10	

Surface Wipe Sampling Criteria

Metal	Acceptable Surface Level µg/ft²	Basis for Criteria
Lead	250	EPA TSCA 40 CFR 745 and HUD Window Sills

Metals in Wipe Limits
(based on one ft² sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead	OSHA ID-121	5.0 µg/ft²	10 µg/ft²

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434
[redacted]

Contact Information
[redacted]

PROJECT REFERENCE
Agreement No.: A 106644
Statement of Work No.: S 167033
Project No: P 167034
Agency/Project Name: ARNG Boone Armory
Location (City, State): Boone, IA

For Lab Use Only
Project /Report #: 1112
Due Date: 5/13/13
Samples Received Chilled? YES NO (circle one)

Conditions on Receipt with Name & Date

Water Sample Codes[3]
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes[4]
STD- Standard
R- Rush®
2D- Two Day Rush*
ND- Next Day Rush*®
SD- Same Day Rush*®
WH- Weekend/Holiday*

Analysis Requested
Lead

ID #	Sample Type[1]	Sample Media[2]	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (in²)	Water Volume (Liters)	Water Code[3]	Turn Around Time[4]	Lab ID #
1	7	12	April 23						144			STD	TM-13-61014
2									144				61015
3									144				61016
4									16				61017
5									16				61018
6									16				61019
7									144				61020
8									16				61021
9									16				61022
10									—				61023

Sample Type Codes[1]
1-Air 2-Water 3-Paint 4-Soil 5-Dust
6-Bulk 7-Wipe 8-Contact Plate
9-Tape 10-Spore Trap (Zefon & others)
11-Other

Sample Media Codes[2]
1-Charcoal 2-XAD 3-Matched Weight
4-Preweighted 5-MEA 6-CCA 7-R2A/TSA
8-Air-O-Cell Cassette 9-MCE Cassette (0.45)
10-MCE Cassette (0.8) 11-MCE Filter 12-Other

Relinquished By	Date & Time	Received By	Date & Time
[redacted]			

COMMENTS:

* Applied to non-viable microbiological samples only.® Applied to asbestos samples, SD: 2-hour PLM/PCM, 6-hour TEM; ND: 24-hour, R: 3-5 business days.

Appendix C

Occupational Health Risk Assessment Codes
(Reference: DOD Letter of Instructions 6055 1)

Occupational health risk assessment codes (RACs) are included in this report to quantify health risks to personnel risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel The following procedure is used to determine the RACs:

STEP 1: This step assesses points to determine the health hazard severity category (HHSC) The HHSC reflects the magnitude of exposure to a physical, chemical, or biological agent and the medical effects of exposure

A Exposure Points Assessed

Alternate Route of Exposure		Exposure Conditions			
		<CT	Occasionally >CT	>CT	>STD
AER Possible	NO	0	3	5	7
	YES	1-2	4	6	8

Notes: 1) AER = Alternate exposure route, such as skin absorption or ingestion 2) CT = DoD component threshold that triggers surveillance actions, such as action level 3) STD = DoD exposure limit, such as TLV or PEL 4) > = Greater than 5) < = Less than 6) ≤ = Less than or equal to

B Medical Effects Points Assessed

Condition	Points
No medical effects, such as nuisance noise and nuisance odor	0
Temporary reversible illness requiring supportive treatment, such as eye irritation and sore throat	1-2
Temporary reversible illness with a variable but limited period of disability, such as metal fume fever	3-4
Permanent, nonsevere illness or loss of capacity, such as permanent hearing loss	5-6
Permanent, severe, disabling, irreversible illness or death, such as asbestosis or lung cancer	7-8

C The HHSC is determined by totaling the points assessed and using the following guide

Total Points*	HHSC
13-16	I
9-12	II
5-8	III
0-4	IV

* Sum of A and B above

STEP 2: This step uses the following guidelines to assess points to determine the mishap probability category (MPC) for health hazards The probability of mishap reflects the duration of exposure and the number of exposed personnel

A Duration of Exposure Points Assessed

Type of Exposure	Length of Exposure		
	1-8 hr/wk	>8 hr/wk/not continuous	Continuous
Irregular/Intermittent	1-2	4-6	NA
Regular/Periodic	2-3	5-7	8

B Number of Exposed personnel Points Assessed

Number of Exposed Personnel	Points
<5	1-2
5-9	3-4
10-49	5-6
>49	7-8

C The MPC for health hazards is determined by totaling the points assessed and using the following guide:

Total Points*	MPC
14-16	A
10-13	B
5-9	C
<5	D

* Sum of A and B above

STEP 3: The RAC is determined using the following matrix:

HHSC	MPC			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

Surface Lead sampling

At

Iowa Army National Guard
Cedar Rapids Armory
Cedar Rapids, Iowa

Survey date:

December 11, 2012

For

Department of the Army
National Guard Bureau
Region West Industrial Hygiene Office
NGB-AVN-S1

Performed by
U.S. Public Health Service
Federal Occupational Health

December 11, 2012

Table of Contents

Appendices

I. Executive Summary

At the request of the National Guard Bureau Region West Industrial Hygiene Office, field personnel representing the U.S. Public Health Service, Federal Occupational Health (FOH) conducted surface lead and lighting survey at the Cedar Rapids National Guard Armory located at Cedar Rapids, Iowa. This survey was conducted as part of the ARNG occupational safety and health program to evaluate potential personnel exposure to contaminants generated during typical activities performed at this facility.

The NGB-ARS Memorandum for the Chiefs of Staff dated February 2, 2006 provides guidance for potential lead hazard exposure in Army National Guard child occupied facilities. The memorandum defines a child occupied facility as a building, or portion of a building, visited on a regular basis by the same child, six years of age or under. Child occupied facilities may include, but are not limited to, day-care centers, preschools, and kindergarten classrooms. The memorandum states that, "For all areas used/occupied on a regular basis by children ages six and under, clean all floors accessible to said children to the EPA dust-lead standard of 40 ug/ft^2. Clean all other surfaces in accordance with USACHPPM recommendations for lead in dust of 200 ug/ft^2 on frequent contact surfaces."

For purposes of this report any surface lead level that exceeds 40 ug/ft^2 in a child occupied area is considered significant. Any surface lead level that exceeds 200 ug/ft^2 in any other area of the facility is considered significant.

Five surface wipe samples were collected and analyzed for lead contamination. Of the Five samples, none had over the recommended standard of 200 ug/ft^2. Exact locations and levels are shown below for each sample. No known activities with small children were apparent in the drill hall.

II. Introduction

Monitoring of lead on workplace surfaces was conducted by the U.S. Public Health Service (USPHS) Federal Occupational Health (FOH) at the Iowa Army National Guard Army, Muscatine Armory located in Muscatine, Iowa. This work was conducted under the Interagency Agreement between the USPHS, FOH and the West Region of the Army National Guard. Bruce Hills, Certified Industrial Hygienist, conducted this survey on December 11th, 2012.

FOH conducted this survey in the interest of preventing employee illness and in meeting legal obligations where applicable. Based on information provided, every effort was made to conduct a comprehensive survey covering the parameters considered. Results and recommendations are based on information provided, field measurements, and conditions observed during the survey.

III. Site Description

The armory consists of a drill room or assembly hall, offices, classrooms, locker room, kitchen, cold storage bay, and break room. Weapons are cleaned in the Drill room.

IV. Assessment Criteria

The NGB-ARS Memorandum for the Chiefs of Staff dated February 2, 2006 provides guidance for potential lead hazard exposure in Army National Guard child occupied facilities. The memorandum defines a child occupied facility as a building, or portion of a building, visited on a regular basis by the same child, six years of age or under. Child occupied facilities may include, but are not limited to, day-care centers, preschools, and kindergarten classrooms. The memorandum states that, "For all areas used/occupied on a regular basis by children ages six and under, clean all floors accessible to said children to the EPA dust-lead standard of 40 ug/ft^2. Clean all other surfaces in accordance with USACHPPM recommendations for lead in dust of 200 ug/ft^2 on frequent contact surfaces."

For purposes of this report any surface lead level that exceeds 40 ug/ft^2 in a child occupied area is considered significant. Any surface lead level that exceeds 200 ug/ft^2 in any other area of the facility is considered significant.

V. Findings, Discussion, and Recommendations

Surface Wipe Samples

Five samples were over the USACHPPM recommend standard of 200 ug/ft^2.Below is a table of the locations of where samples were taken, as well as the lead concentration. The sample taken in the vault was above the 200 ug/ft^2 standard and should not be considered as an area where children could occupy.

Table 1
Area Wipe Sampling Results for Lead
Iowa Army National Guard
Cedar Rapids Armory
December 11, 2012

Sample Number	Location	Lead ug/ft^2
W-1	Break room fridge	<91
W-2	Drill room floor	<10
W-3	drill room food serving area	<10
W-4	Classroom 249B	<91
W-5	On food vending machine	<91
W-6	blank	0

Note: 1) ug/ft^2= micrograms per square foot of surface area. 2) **Bold** indicates that concentration was "significant."

Recommendations:

1. Continue regular cleaning of the facility.

2. A thorough cleaning after ever drill period or in the event of 2 or more units occupying the armory, at least once each month. Care should be taken to keep the areas that are likely to be occupied by children clean and free from lead (Below 40 ug/ft^2).

Technical Assistance: For technical assistance regarding information found in this report or the performed survey, please contact the Non-Responsive

This survey conducted by, and report written by Non-Responsive, CIH, as a representative of Federal Occupational Health, U. S. Public Health Service. Non-Responsive, Regional Industrial Hygienist at the NGB Region West Industrial Hygiene Office and Non-Responsive with FOH, reviewed and approved this report.

Reviewed by:
Non-Responsive
Non-Responsive

Reviewed by:
Non-Responsive
Non-Responsive

Appendix A

Iowa Army National Guard State Points of Contact

Cedar Rapids Armory Point of Contact

Non-Responsive

Appendix B

FOH ENVIRONMENTAL LABORATORY
536 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead

Sampling Site:	NGB, Cedar Rapids, IA (AFRC)
Sample Media:	Ghost Wipe(s)®
Method Reference:	OSHA ID-121
Project ID:	Project 10850
DFOH Lab Nos.:	TM-13-58857 through TM-13-58862
Date Received:	12/14/12
Data Analyzed:	12/18/12 -12/19/12
Date Issued:	12/19/12

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at Non-Responsive

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

FOH ENVIRONMENTAL LABORATORY

636 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
W1	TM-13-58857	<10	<91
W2	TM-13-58858	<10	<10
W3	TM-13-58859	<10	<10
W4	TM-13-58860	<10	<91
W5	TM-13-58861	<10	<91
W6**	TM-13-58862	<10	None Detected

Surface Wipe Sampling Criteria

Metal	Acceptable Surface Level µg/ft	Basis for Criteria
Lead	250	EPA TSCA 40 CFR 745 and HUD Window Sills

Metals in Wipe Limits
(based on one ft² sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead	OSHA ID 121	6.0 µg/ft²	10 µg/ft²

Non-Responsive

-

AIHA LAP, LLC
ACCREDITED LABORATORY

Project 10850
Page 2 of 2

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434

[redacted] Non-Responsive

PROJECT REFERENCE

Agreement No.:	A 106644
Statement of Work No.:	S 167033
Project No:	P 167034
Agency	
Proj. Manager	
Location (City, State):	Cedar Rapids, IA AFRC

For Lab Use Only
Project /Report #: 10850
Due Date: 12/24/12
Samples Received Chilled? YES NO (circle one)

Conditions on Receipt with Name & Date

Rev. 01/2010

Water Sample Codes
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes
STD- Standard
3D- Three Day Rush[@]
WH Weekend/Holiday*

Analysis Requested

ID #	Sample Type[1]	Sample Media[2]	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code[3]	Turn Around Time[4]	Lab ID #	Lead
W-1	7	5	12/11/12		Break room fridge				.11				TM-13-58857	/
W-2	7	5			Drill Room floor				1.0				58858	/
W-3	7	5							1.0				58859	/
W-4	7	5							.11				58860	/
W-5	7	5							.11				58861	/
W-6	7	5	↓						⌣				58862	/

Sample Type Codes
1-Air 2-Water 3-Paint 4-Soil 5-Dust
6-Bulk 7-Wipe 8 - Other

Sample Media Codes
1-Charcoal 2-Matched Weight, 0.8um
3-PVC filter 4-M CE 0.8 um, 37 mm
5 -Ghost Wipes™ 6. Passive badge
7. Other

Relinquished By / Date & Time / Received By / Date & Time
[redacted] Non-Responsive

COMMENTS:

* Applied to organic and inorganic analysis in cases of an emergency only. [@] Applied to inorganic and organic samples, SD: Applied to organic and inorganic samples 7-10 business days.

Appendix C

Occupational Health Risk Assessment Codes

(Reference: DOD Letter of Instructions 6055 1)

Occupational health risk assessment codes (RACs) are included in this report to quantify health risks to personnel Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel The following procedure is used to determine the RACs:

STEP 1: This step assesses points to determine the health hazard severity category (HHSC) The HHSC reflects the magnitude of exposure to a physical, chemical, or biological agent and the medical effects of exposure

A Exposure Points Assessed

Alternate Route of Exposure		Exposure Conditions			
		<CT	Occasionally >CT	>CT	>STD
AER Possible	NO	0	3	5	7
	YES	1-2	4	6	8

Notes: 1) AER = Alternate exposure route, such as skin absorption or ingestion 2) CT = DoD component threshold that triggers surveillance actions, such as action level 3) STD = DoD exposure limit, such as TLV or PEL 4) > = Greater than 5) < = Less than 6) ≤ = Less than or equal to

B Medical Effects Points Assessed

Condition	Points
No medical effects, such as nuisance noise and nuisance odor	0
Temporary reversible illness requiring supportive treatment, such as eye irritation and sore throat	1-2
Temporary reversible illness with a variable but limited period of disability, such as metal fume fever	3-4
Permanent, nonsevere illness or loss of capacity, such as permanent hearing loss	5-6
Permanent, severe, disabling, irreversible illness or death, such as asbestosis or lung cancer	7-8

C The HHSC is determined by totaling the points assessed and using the following guide

Total Points*	HHSC
13-16	I
9-12	II
5-8	III
0-4	IV

* Sum of A and B above

STEP 2: This step uses the following guidelines to assess points to determine the mishap probability category (MPC) for health hazards The probability of mishap reflects the duration of exposure and the number of exposed personnel

A Duration of Exposure Points Assessed

Type of Exposure	Length of Exposure		
	1-8 hr/wk	>8 hr/wk/not continuous	Continuous
Irregular/Intermittent	1-2	4-6	NA
Regular/Periodic	2-3	5-7	8

B Number of Exposed personnel Points Assessed

Number of Exposed Personnel	Points
<5	1-2
5-9	3-4
10-49	5-6
>49	7-8

C The MPC for health hazards is determined by totaling the points assessed and using the following guide:

Total Points*	MPC
14-16	A
10-13	B
5-9	C
<5	D

* Sum of A and B above

STEP 3: The RAC is determined using the following matrix:

HHSC	MPC			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

National Guard Bureau
Mid-West Regional Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

ARNG-CSG-P October 14, 2014

MEMORANDUM FOR: The Adjutant General for Iowa

SUBJECT: Industrial Hygiene Survey at Council Bluffs Armory, Council Bluffs, Iowa

At the request of the National Guard Bureau (NGB) Mid-West Regional Industrial Hygiene (IH) Office, Non-Responsive, Certified Industrial Hygienist (CIH), conducted a survey on September 16, 2014 at the Iowa Army National Guard Council Bluffs Armory, 2415 E. Kanesville Blvd., Council Bluffs, Iowa. The site point of contact was Non-Responsive

The NGB conducted this survey in the interest of preventing employee illness and in meeting legal obligations where applicable. Based on information provided, every effort was made to conduct a comprehensive survey covering the parameters considered. Results and recommendations are based on information provided by site personnel, field measurements, and conditions observed during the survey. Changes in work practices and/or processes may change employee exposure levels. Use of different materials may result in exposure to a different air contaminant.

Occupational health risk assessment codes (RACs) are assigned to quantify health risks to personnel in accordance with DOD Letter of Instruction 6055.1, *DOD Safety and Occupational Health Program*. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. RAC descriptors are as follows: 1 = Critical, 2 = Serious, 3 = Moderate, 4 = Minor, and 5 = Negligible.

The Council Bluffs Armory was built in 1995 and renovated in 2012. The facility has 50,030 square feet of floor space. The Council Bluffs Armory is the base of operations for HHC 168th, Delta Company RSP, Det 1 Fox Company BSB, and Battalion HQ. During the week, most of the activities at the armory involve administrative work. Site personnel reported that vehicle maintenance activities are mostly limited to fluid checks and tire changes on drill weekends, and that no major vehicle maintenance is performed at the armory. No vehicle maintenance was performed on the day of the survey. The Council Bluffs Armory had an indoor firing range (IFR) that was closed between 2011 and 2012 and converted to an EST 2000 room. Weapons may be cleaned in the vault, in the supply room, or on tables set up on the drill floor.

The armory is available for rental for community activities that include: birthday parties, wedding receptions, wrestling clubs and family readiness group meetings. The industrial hygiene survey included a walkthrough of the facility and interviews with employees.

Wipe samples were collected on representative surfaces in the facility and analyzed for lead. For purposes of this report, any results that exceed the guidelines adopted by the NGB Mid-West Regional IH Office are considered significant. One of the surface wipe sample results exceeded the guideline for lead. Sample IACBAW24, which was collected on the west wall in the EST room, the bullet trap area in the former IFR, had a lead concentration of 1,259 µg/ft^2. <u>The following actions are required:</u>

- **Clean the surfaces where lead may be present using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).**
- **Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).**
- **When weapons are cleaned, special attention should be given to cleaning up the work area to prevent potential lead contamination from ammunition (RAC 2).**

A lighting survey was conducted in the shops and offices in the Council Bluffs Armory. Eight of the areas surveyed did not meet minimum illumination requirements. The following actions are required:

- **Increase the illumination levels in the facility areas that did not meet minimum illumination requirements (RAC 4).**

For any further questions, please contact Non-Responsive

Non-Responsive

Regional Industrial Hygienist

Appendix	Title	Status
A.	Lead – Wipe Sampling	Attached
B.	Lighting	Attached

Appendix A
Lead – Wipe Sampling

Surface Area Wipe Samples

Wipe samples were collected from representative areas of the facility using Environmental Express Ghost™ Wipes and templates in accordance with the OSHA wipe sampling method (OSHA Technical Manual, Appendix II, 2-1). In addition, surface wipe samples were collected in the kitchen to assess migration of lead into food handling spaces. The samples were analyzed for lead by OSHA Method ID-121. The results and photos are contained in Table A-1.

The Occupational Safety and Health Administration (OSHA) requires that all surfaces must be kept as free as practicable of accumulations of toxic metal dusts (29 CFR 1910). In addition, DOD has instituted a new policy to minimize surface contamination levels of heavy metals (*Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations*, DTM 12-003, 18 April 2012).

The NGB Mid-West Regional IH Office has adopted the guidelines for metal dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges* and the Department of Energy (DOE)/ Brookhaven National Laboratory (BNL) *Surface Wipe Sampling Procedure* (IH75190). Any results that exceed these guidelines, which are shown in Table A-1, are considered significant. One of the surface wipe sample results exceeded the guideline for lead. Sample IACBAW24, which was collected on the west wall in the EST room, the bullet trap area in the former indoor firing range, had a lead concentration of 1,259 $\mu g/ft^2$.

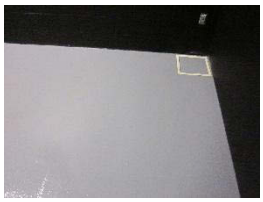
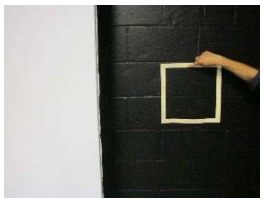
Recommendations:

1. Clean the surfaces where lead may be present by using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).

2. Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).

3. When weapons are cleaned, special attention should be given to cleaning up the work area to prevent potential lead contamination from ammunition (RAC 2).

Table A-1
Surface Area Wipe Sampling Results for Lead
Iowa Army National Guard
Council Bluffs Armory
Council Bluffs, Iowa
September 16, 2014

Sample #	Location	Photo	Lead ($\mu g/ft^2$)
Surface Guideline			**200**
IACBAW21	EST room, former IFR, at firing line, northeast corner on floor		<10
IACBAW22	EST room, former IFR, midrange, along south wall on floor		<10
IACBAW23	EST room, former IFR, at the bullet trap, southwest corner on floor		<10
IACBAW24	EST room, former IFR, at the bullet trap, on west wall		**1,259**
IACBAW25	EST room, former IFR, on top of return air duct		<10
IACBAW26	South HHC drill floor, center, on floor		<10

Sample #	Location	Photo	Lead ($\mu g/ft^2$)
Surface Guideline			**200**
IACBAW27	HHC vault, on floor		21
IACBAW28	Kitchen, on oven		<10
IACBAW29	Family readiness room, on center table		<10
IACBAW30	Field blank	N/A	ND

Notes: 1) $\mu g/ft^2$ = micrograms per square foot of surface area. 2) ND = none detected. 3) "<" means less than the reporting limit for the analytical method.

Laboratory Result Reports and Chain of Custody Sheets

FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead
Sampling Site: NGB: Council Bluffs, IA (Armory)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 12071
DFOH Lab Nos.: TM-14-72620 through TM-14-72629
Date Received: 09/19/14
Data Analyzed: 09/22/14 – 09/23/14
Date Issued: 09/24/14

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame and/or Perkin Elmer 600 furnace atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at Non-Responsive

Non-Responsive

AIHA LAP, LLC ACCREDITED LABORATORY

Project 12071
Page 1 of 2

FOH ENVIRONMENTAL LABORATORY

636 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IACBAW21	TM-14-72620	<10	<10
IACBAW22	TM-14-72621	<10	<10
IACBAW23	TM-14-72622	<10	<10
IACBAW24	TM-14-72623	1259	1259
IACBAW25	TM-14-72624	<10	<10
IACBAW26	TM-14-72625	<10	<10
IACBAW27	TM-14-72626	21	21
IACBAW28	TM-14-72627	<10	<10
IACBAW29	TM-14-72628	<10	<10
IACBAW30**	TM-14-72629	<10	

AGENCY	FLOORS	INTERIOR WINDOW SILLS	WINDOW TROUGHS
EPA	40 µg/ft²	250 µg/ft²	400 µg/ft²

Metals in Wipe Limits
(based on one ft² sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead – Flame AA	OSHA ID-121	5.0 µg/ft²	10 µg/ft²

Non-Responsive

AIHA LAP, LLC ACCREDITED LABORATORY

Project 12071
Page 2 of 2

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET 1 of 1

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434

Non-Responsive

PROJECT REFERENCE
Agreement No.: A 106444
Statement of Work No.: S 180648
Project No: P 189649
Agency Proj. Manager: IAARNG
Location (City, State): Council Bluffs Armory Council Bluffs, IA

For Lab Use Only
Project /Report #: 12076
Due Date: 9/20/14
Samples Received Chilled? YES NO (circle one)
Conditions on Receipt with Name & Date
Rev. 07/2010

Water Sample Codes*
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes*
STD- Standard
3D- Three Day Rush@
WH Weekend/Holiday*

Analysis Requested: Lead

Sample ID #	Type*	Media*	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code*	Turn Around Time*	Lab ID #
IACBAW21	7	5	9/16	14					1				14-M-72620
22													72621
23													72622
24													72623
25													72624
26													72625
27													72626
28													72627
29									↓				72628
30	↓	↓	↓		Field blank				–				72629

Sample Type Codes*: 1-Air 2-Water 3-Paint 4-Soil 5-Dust 6-Bulk 7-Wipe 8 - Other

Sample Media Codes*: 1-Charcoal 2-Matched Weight, 0.8um 3-PVC filter 4-M CE 0.8 um , 37 mm 5 -Ghost Wipes™ 6. Passive badge 7. Other

Relinquished By | Date & Time | Received By | Date & Time

Non-Responsive

COMMENTS: Wipes are 1 square foot samples

* Applied to organic and inorganic analysis in cases of an emergency only. @ Applied to inorganic and organic samples, SD: Applied to organic and inorganic samples 7-10 business days.

Appendix B
Lighting

Illumination levels were measured with an Extech Instruments Model 407026 Light Meter calibrated according to the manufacturer's specifications. The results were compared with the recommendations in the National Guard Bureau Facility Design Guides and the American National Standards Institute/Illuminating Engineering Society of North America RP-1 (Offices) and RP-7 (Industrial Facilities) guidelines. The results and the lighting criteria are contained in Table B-1. Eight spaces in the facility did not meet the minimum lighting level.

Table B-1
Lighting Measurements
Iowa Army National Guard
Council Bluffs Armory
Council Bluffs, Iowa
September 16, 2014

Locations	Measured Illumination (foot candles)	Required Illumination (foot candles)	Standard Met?
EST 2000 room	25-34	30	Partially
Fox company vault	23-31	30	Partially
Supply	29-32	30	Partially
Drill floor, south HHC	11-23	50	No
HHC vault	16-27	30	No
Kitchen	32-52	50	Partially
Family room	31-51	50	Partially
Room 145-2, Classroom	64-101	50	Yes
Room 144-2, Classroom	32-44	50	No
Room 122A, Office	85-88	50	Yes
Mail room	67-84	50	Yes

Recommendations:

1. Increase the illumination levels in the facility areas that did not meet minimum illumination requirements (RAC 4).

National Guard Bureau
Mid-West Regional Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

ARNG-CSG-P September 6, 2014

MEMORANDUM FOR: The Adjutant General for Iowa

SUBJECT: Industrial Hygiene Survey at Fairfield Armory, Fairfield, Iowa

At the request of the National Guard Bureau (NGB) Mid-West Regional Industrial Hygiene (IH) Office, Non-Responsive, Certified Industrial Hygienist (CIH), conducted a survey on July 10, 2014 at the Iowa Army National Guard Fairfield Armory, 1501 W. Stone Ave., Fairfield, Iowa. The site points of contact were Non-Responsive and Non-Responsive .

The NGB conducted this survey in the interest of preventing employee illness and in meeting legal obligations where applicable. Based on information provided, every effort was made to conduct a comprehensive survey covering the parameters considered. Results and recommendations are based on information provided by site personnel, field measurements, and conditions observed during the survey. Changes in work practices and/or processes may change employee exposure levels. Use of different materials may result in exposure to a different air contaminant.

Occupational health risk assessment codes (RACs) are assigned to quantify health risks to personnel in accordance with DOD Letter of Instruction 6055.1, *DOD Safety and Occupational Health Program*. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. RAC descriptors are as follows: 1 = Critical, 2 = Serious, 3 = Moderate, 4 = Minor, and 5 = Negligible.

The Fairfield Armory was built in 1956 and renovated in 2000. The armory is the base of operations for FSC Company Alpha, the 34th Army Band, and the HHC 224th Engineer Company. During the week, most of the activities at the armory involve administrative work. Site personnel reported that vehicle maintenance activities are mostly limited to fluid checks and tire changes on drill weekends, and that no major vehicle maintenance is performed at the armory. No vehicle maintenance was performed on the day of the survey. The Fairfield Armory had an indoor firing range that was closed in 1984 and converted into the upstairs classroom area. Weapons may be cleaned in the vault, in the supply room, or on tables set up on the drill floor.

The armory is available for rental for community activities that include: wedding receptions, Boy and Girl Scout meetings and cookie distribution, auctions, dances, job fairs, and a high school fitness camp. The industrial hygiene survey included a walkthrough of the facility and interviews with employees.

Wipe samples were collected on representative surfaces in the facility and analyzed for toxic metals (lead, cadmium, and chromium). For purposes of this report, any results that exceed the guidelines adopted by the NGB Mid-West Regional IH Office are considered significant. One of the surface wipe sample results exceeded the guideline for cadmium. Sample IAFBW25, which was collected on the floor in the vault, had a cadmium concentration of 95 µg/ft^2. The following actions are required:

- **Clean the horizontal surfaces where toxic metals may be present using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).**
- **Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).**
- **When weapons are cleaned, special attention should be given to cleaning up the work area to prevent potential lead contamination from ammunition (RAC 2).**

A lighting survey was conducted in the shops and offices in the Fairfield Armory. Thirty-four of the areas surveyed did not meet minimum illumination requirements. The following actions are required:

- **Increase the illumination levels in the facility areas that did not meet minimum illumination requirements (RAC 4).**

For any further questions, please contact Non-Responsive

Non-Responsive

Regional Industrial Hygienist

Appendix	Title	Status
A.	Metals – Wipe Sampling	Attached
B.	Lighting	Attached

Appendix A
Metals – Wipe Sampling

Surface Area Wipe Samples

Wipe samples were collected from representative areas of the facility using Environmental Express Ghost™ Wipes and templates in accordance with the OSHA wipe sampling method (OSHA Technical Manual, Appendix II, 2-1). In addition, surface wipe samples were collected in the kitchen to assess migration of toxic metals into food handling spaces. The samples were analyzed for toxic metals by OSHA Method ID-121. The results and photos are contained in Table A-1.

The Occupational Safety and Health Administration (OSHA) requires that all surfaces must be kept as free as practicable of accumulations of toxic metal dusts (29 CFR 1910). In addition, DOD has instituted a new policy to minimize surface contamination levels of heavy metals (*Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations*, DTM 12-003, 18 April 2012).

The NGB Mid-West Regional IH Office has adopted the guidelines for metal dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges* and the Department of Energy (DOE)/ Brookhaven National Laboratory (BNL) *Surface Wipe Sampling Procedure* (IH75190). Any results that exceed these guidelines, which are shown in Table A-1, are considered significant. One of the surface wipe sample results exceeded the guideline for cadmium. Sample IAFBW25, which was collected on the floor in the vault, had a cadmium concentration of 95 µg/ft^2.

Table A-1
Surface Area Wipe Sampling Results for Toxic Metals
Iowa Army National Guard
Fairfield Armory
Fairfield, Iowa
July 10, 2014

Sample #	Location	Photo	Lead (µg/ft^2)	Cadmium (µg/ft^2)	Chromium (µg/ft^2)
Surface Guideline			**200**	**28**	**6,970**
IAFBW21	Drill floor, center on floor		<91	<9.1	<91
IAFBW22	Kitchen, on food preparation table		<91	<9.1	<91

Sample #	Location	Photo	Lead ($\mu g/ft^2$)	Cadmium ($\mu g/ft^2$)	Chromium ($\mu g/ft^2$)
Surface Guideline			**200**	**28**	**6,970**
IAFBW23	Classroom, former IFR, at former firing line, on floor		<91	<9.1	<91
IAFBW24	Room 207, Medic room, former IFR, at former bullet trap, on floor		<91	<9.1	<91
IAFBW25	Room 129, Vault, on floor		<91	**95**	<91
IAFBW26	Field blank	N/A	ND	ND	ND

Notes: 1) $\mu g/ft^2$ = micrograms per square foot of surface area. 2) ND = none detected. 3) "<" means less than the reporting limit for the analytical method.

Recommendations:

1. Clean the horizontal surfaces where toxic metals may be present by using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).

2. Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).

3. When weapons are cleaned, special attention should be given to cleaning up the work area to prevent potential lead contamination from ammunition (RAC 2).

Laboratory Result Reports and Chain of Custody Sheets

FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By: Non-Responsive

Reference Data: Lead, Cadmium and Chromium
Sampling Site: NGB: Fairfield, IA (Armory)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 11898
DFOH Lab Nos.: TM-14-69034 through TM-14-69039
Date Received: 07/15/14
Data Analyzed: 07/16/14
Date Issued: 07/16/14

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

Non-Responsive

AIHA LAP, LLC ACCREDITED LABORATORY

FOH ENVIRONMENTAL LABORATORY
638 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 888-0413 FAX: (312) 888-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IAFBW21	TM-14-69034	<10	<91
IAFBW22	TM-14-69035	<10	<91
IAFBW23	TM-14-69036	<10	<91
IAFBW24	TM-14-69037	<10	<91
IAFBW25	TM-14-69038	<10	<91
IAFBW26**	TM-14-69039	<10	

CADMIUM on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IAFBW21	TM-14-69034	<1.0	<9.1
IAFBW22	TM-14-69035	<1.0	<9.1
IAFBW23	TM-14-69036	<1.0	<9.1
IAFBW24	TM-14-69037	<1.0	<9.1
IAFBW25	TM-14-69038	10	95
IAFBW26**	TM-14-69039	<1.0	

CHROMIUM on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IAFBW21	TM-14-69034	<10	<91
IAFBW22	TM-14-69035	<10	<91
IAFBW23	TM-14-69036	<10	<91
IAFBW24	TM-14-69037	<10	<91
IAFBW25	TM-14-69038	<10	<91
IAFBW26**	TM-14-69039	<10	

Surface Wipe Sampling Criteria

Metal	Acceptable Surface Level µg/ft	Basis for Criteria
Cadmium	28	Brookhaven National Laboratory, Surface Wipe Sampling Procedure, Risk Assessment for Metals, IH75190 Rev 18 5/10/11
Chromium	6,970	Brookhaven National Laboratory, Surface Wipe Sampling Procedure, Risk Assessment for Metals, IH75190 Rev 18 5/10/11
Lead	250	EPA TSCA 40 CFR 745 and HUD Window Sills

AIHA LAP, LLC ACCREDITED LABORATORY

Project 11898
Page 2 of 3

FOH ENVIRONMENTAL LABORATORY

636 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 888-0413 FAX: (312) 888-0434

Metals in Wipe Limits
(based on one ft^2 sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead	OSHA ID-121	5.0 µg/ft^2	10 µg/ft^2
Cadmium	OSHA ID-121	0.5 µg/ft^2	1.0 µg/ft^2
Chromium	OSHA ID-121	5.0 µg/ft^2	10 µg/ft^2

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

Project 11898
Page 3 of 3

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434
Non-Responsive

Name: Non-Responsive
Address:
Phone/F
Email:

PROJECT REFERENCE
Agreement No.: A 106644
Statement of Work No.: S 180648
Project No: P 189649
Agency: IAARNG
Proj. Manager:
Location (City, State): Fairfield Armory, Fairfield, IA

For Lab Use Only: 11898
Project /Report #:
Due Date: 7/31/14
Samples Received Chilled? YES NO (circle one)
Conditions on Receipt with Name & Date
Rev. 07/2010

Water Sample Codes[1]
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes[1]
STD- Standard
3D- Three Day Rush[@]
WH Weekend/Holiday*

Analysis Requested: Lead, Cadmium, Chromium

Sample ID #	Type[1]	Media[2]	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code[3]	Turn Around Time*	Lab ID #
IAFBW21	7	5	7/10	14					100 cm^2				TM-14-69034
22													69035
23													69036
24													69037
25													69038
26					Field blank				-				69039

Sample Type Codes[1]: 1-Air 2-Water 3-Paint 4-Soil 5-Dust 6-Bulk 7-Wipe 8 - Other

Sample Media Codes[2]: 1-Charcoal 2-Matched Weight, 0.8um 3-PVC filter 4-M CE 0.8 um , 37 mm 5 -Ghost Wipes™ 6. Passive badge 7. Other

Relinquished By	Date & Time	Received By	Date & Time
Non-Responsive			

COMMENTS:

* Applied to organic and inorganic analysis in cases of an emergency only. @ Applied to inorganic and organic samples. SD: Applied to organic and inorganic samples 7-10 business days.

Appendix B
Lighting

Illumination levels were measured with an Extech Instruments Model 407026 Light Meter calibrated according to the manufacturer's specifications. The results were compared with the recommendations in the National Guard Bureau Facility Design Guides and the American National Standards Institute/Illuminating Engineering Society of North America RP-1 (Offices) and RP-7 (Industrial Facilities) guidelines. The results and the lighting criteria are contained in Table B-1. Thirty-four spaces in the facility did not meet the minimum lighting level.

Table B-1
Lighting Measurements
Iowa Army National Guard
Fairfield Armory
Fairfield, Iowa
July 10, 2014

Locations	Measured Illumination (foot candles)	Required Illumination (foot candles)	Standard Met?
Room 131, HHC office	26-69	50	Partially
NCO office	41-62	50	Partially
Commander office	22-44	50	No
Room 130B, Supply room	35-55	30	Yes
Drill floor	29-49	50	No
Room 128, FSC office	15-18	50	No
Room 126, FSC orderly office	48-53	50	Partially
Room 127B, FSC supply	9-11	30	No
Room 124, Mechanical room	7-28	30	No
Room 122A, Kitchen	70-168	50	Yes
Room 116, Men's latrine	40-80	30	Yes
Room 116, Men's shower	31-34	30	Yes
Room 119, Women's latrine	53-56	30	Yes
Room 119, Women's shower	28-40	30	Partially
Room 154, Classroom 3	22-42	50	No
Room 153, Classroom 2	69-126	50	Yes
Room 161, Supply	20-24	30	No
Room 152, Classroom 1	37-83	50	Partially
Room 166, Men's locker room	25-45	30	Partially
PT area, in locker room	21-29	50	No
Room 160, Mechanical room	15-17	30	No
Room 145, band office	38-46	50	No
Room 146, Commander office	27-40	50	No
Room 144, 1SGT office	38-42	50	No
Room 143, office	50-53	50	Yes
Music library	67-70	50	Yes

Room 141, Rehearsal room 2	28-36	50	No
Room 140, Rehearsal room 1	25-32	50	No
Room 162, Female locker room	17-20	30	No
Room 165, Instrument storage	7-11	30	No
Room 167, Supply/band storage	4-7	30	No
34th Band common area	64-67	30	Yes
S-4 Logistics office	81-95	50	Yes
Room 101, S-1 log/personnel office	82-145	50	Yes
Room 110, S-3 operations office	67-80	50	Yes
Room 105, office	62-81	50	Yes
Room 104, SIPR room	75-94	50	Yes
Room 106, Multipurpose room	55-68	50	Yes
Room 107A, Commander office	70-85	50	Yes
Room 100B, Janitor closet	10-27	30	No
Room 109, ICN classroom	24-45	50	No
Room 112, Table/chair storage	1-2	30	No
Room 111, Mechanical room	20-21	30	No
Room 208, Classroom	18-21	50	No
Room 204, Conference/briefing room (some light bulbs were missing or purposely removed)	3-63	50	Partially
Room 207, Medical treatment room	38-55	50	Partially
Room 203A, Battalion commander/1SGT office	29-43	50	No
Room 202, S-2/3 intel/ops	29-32	50	No
Room 206, Distribution	119-143	30	Yes
Room 201, Orderly room	37-68	50	Partially
Room 129, Vault	26-31	30	Partially

Recommendations:

1. Increase the illumination levels in the facility areas that did not meet minimum illumination requirements (RAC 4).

National Guard Bureau
Mid-West Regional Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

ARNG-CSG-P June 25, 2014

MEMORANDUM FOR: The Adjutant General for Iowa

SUBJECT: Industrial Hygiene Survey at Former Indoor Firing Range in Oskaloosa Armory, Oskaloosa, Iowa

At the request of the National Guard Bureau (NGB) Mid-West Regional Industrial Hygiene (IH) Office, Non-Responsive, Certified Industrial Hygienist (CIH), conducted a survey on April 25, 2014 at the Iowa Army National Guard former indoor firing range (IFR) in the Oskaloosa Armory, 2260 Highway 63, Oskaloosa, Iowa. The site point of contact was Non-Responsive .

The NGB conducted this survey in the interest of preventing employee illness and in meeting legal obligations where applicable. Based on information provided, every effort was made to conduct a comprehensive survey covering the parameters considered. Results and recommendations are based on information provided by site personnel, field measurements, and conditions observed during the survey. Changes in work practices and/or processes may change employee exposure levels. Use of different materials may result in exposure to a different air contaminant.

Occupational health risk assessment codes (RACs) are assigned to quantify health risks to personnel in accordance with DOD Letter of Instruction 6055.1, *DOD Safety and Occupational Health Program*. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. RAC descriptors are as follows: 1 = Critical, 2 = Serious, 3 = Moderate, 4 = Minor, and 5 = Negligible.

The Oskaloosa Armory is the base of operations for the 3654th Maintenance Company. The IFR in Oskaloosa was closed in 2013. A lead decontamination was performed and the floor was sealed with epoxy. The IFR was then converted into a locker room The state occupational health manager requested that the closed indoor firing range be retested for lead/toxic metals. The industrial hygiene survey included a walkthrough of the facility and interviews with employees.

Wipe samples were collected on representative surfaces in the facility and analyzed for toxic metals (lead, cadmium, and chromium). For purposes of this report, any results that exceed the guidelines adopted by the NGB Mid-West Regional IH Office are considered significant. Two of the surface wipe sample results exceeded the guideline for lead. A sample collected on top of a supply duct in the former observation area of the IFR had a lead concentration of 389 μg/ft^2. A sample collected inside the air return duct in the former observation area of the IFR, had a lead concentration of 329 μg/ft^2. The following actions are required:

- **The closed indoor firing range should be cleaned up as specified by the procedures contained in NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges. Residual lead contamination of surfaces must be less than 200 ug/ft^2 (RAC 2).**

- **Clean the horizontal surfaces where lead may be present using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).**

For any further questions, please contact Non-Responsive

Non-Responsive

Appendix	Title	Status
A.	Metals – Wipe Sampling	Attached

Appendix A
Metals – Wipe Sampling

Surface Area Wipe Samples

Wipe samples were collected from representative areas of the facility using Environmental Express Ghost™ Wipes and templates in accordance with the OSHA wipe sampling method (OSHA Technical Manual, Appendix II, 2-1). The samples were analyzed for toxic metals by OSHA Method ID-121. The results and photos are contained in Table A-1.

The Occupational Safety and Health Administration (OSHA) requires that all surfaces must be kept as free as practicable of accumulations of toxic metal dusts (29 CFR 1910). In addition, DOD has instituted a new policy to minimize surface contamination levels of heavy metals (*Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations*, DTM 12-003, 18 April 2012).

The NGB Mid-West Regional IH Office has adopted the guidelines for metal dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges* and the Department of Energy (DOE)/ Brookhaven National Laboratory (BNL) *Surface Wipe Sampling Procedure* (IH75190). Any results that exceed these guidelines, which are shown in Table A-1, are considered significant.

Two of the surface wipe sample results exceeded the guideline for lead. Sample IAOSIFW7, which was collected on top of a supply duct in the former observation area, had a lead concentration of 389 μg/ft^2. Sample IAOSIFW9, which was collected inside the air return duct in the former observation area, had a lead concentration of 329 μg/ft^2 (Figure A-1). The closed indoor firing range should be cleaned up as specified by the procedures contained in NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges. Residual lead contamination of surfaces must be less than 200 ug/ft^2 (RAC 2).

Recommendations:

1. The closed indoor firing range should be cleaned up as specified by the procedures contained in NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges. Residual lead contamination of surfaces must be less than 200 ug/ft^2 (RAC 2).

2. Clean the horizontal surfaces where lead may be present using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).

Table A-1
Surface Area Wipe Sampling Results for Toxic Metals
Iowa Army National Guard
Oskaloosa Armory former Indoor Firing Range
Oskaloosa, Iowa
April 25, 2014

Sample #	Location	Photo	Lead (µg/ft^2)	Cadmium (µg/ft^2)	Chromium (µg/ft^2)
Surface Guideline			**200**	**28**	**6,970**
IAOSIFW1	In hallway outside of entrance to room 129, on floor		<91	14	<91
IAOSIFW2	Former observation area, at entrance, on floor		<91	<9.1	<91
IAOSIFW3	Former firing line, on floor		<91	<9.1	<91
IAOSIFW4	Midrange, on floor		<91	<9.1	<91
IAOSIFW5	Former bullet trap area, in corner, on floor		<91	<9.1	125
IAOSIFW6	Former bullet trap area, on top of supply duct		<91	<9.1	<91

Sample #	Location	Photo	Lead (µg/ft^2)	Cadmium (µg/ft^2)	Chromium (µg/ft^2)
Surface Guideline			**200**	**28**	**6,970**
IAOSIFW7	Former observation area, on top of supply duct (near entrance to room 129, locker room)		**389**	<9.1	<91
IAOSIFW8	Former observation area, inside supply duct (along side wall)		<91	<9.1	<91
IAOSIFW9	Former observation area, inside air return duct (near entrance to room 129, locker room)	 	**329**	<9.1	<91
IAOSIFW10	Field blank	N/A	ND	ND	ND

Notes: 1) µg/ft^2 = micrograms per square foot of surface area. 2) ND = none detected. 3) "<" means less than the reporting limit for the analytical method.

Figure A-1 Dust Accumulation Inside of Return Air Duct, Near the Area Where Sample IAOSIFW9 Was Collected

Laboratory Result Reports and Chain of Custody Sheets

FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead, Cadmium and Chromium
Sampling Site: NGB: Oskaloosa, IA (Indoor Firing Range)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 11750
DFOH Lab Nos.: TM-14-67522 through TM-14-67531
Date Received: 04/30/14
Data Analyzed: 04/30/14 – 05/01/14
Date Issued: 05/05/14

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

Non-Responsive

AIHA LAP, LLC ACCREDITED LABORATORY

FOH ENVIRONMENTAL LABORATORY
638 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IAOSIFW1	TM-14-67522	<10	<91
IAOSIFW2	TM-14-67523	<10	<91
IAOSIFW3	TM-14-67524	<10	<91
IAOSIFW4	TM-14-67525	<10	<91
IAOSIFW5	TM-14-67526	<10	<91
IAOSIFW6	TM-14-67527	<10	<91
IAOSIFW7	TM-14-67528	43	389
IAOSIFW8	TM-14-67529	<10	<91
IAOSIFW9	TM-14-67530	36	329
IAOSIFW10**	TM-14-67531	<10	

CADMIUM on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IAOSIFW1	TM-14-67522	1.5	14
IAOSIFW2	TM-14-67523	<1.0	<9.1
IAOSIFW3	TM-14-67524	<1.0	<9.1
IAOSIFW4	TM-14-67525	<1.0	<9.1
IAOSIFW5	TM-14-67526	<1.0	<9.1
IAOSIFW6	TM-14-67527	<1.0	<9.1
IAOSIFW7	TM-14-67528	<1.0	<9.1
IAOSIFW8	TM-14-67529	<1.0	<9.1
IAOSIFW9	TM-14-67530	<1.0	<9.1
IAOSIFW10**	TM-14-67531	<1.0	

CHROMIUM on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IAOSIFW1	TM-14-67522	<10	<91
IAOSIFW2	TM-14-67523	<10	<91
IAOSIFW3	TM-14-67524	<10	<91
IAOSIFW4	TM-14-67525	<10	<91
IAOSIFW5	TM-14-67526	14	125
IAOSIFW6	TM-14-67527	<10	<91
IAOSIFW7	TM-14-67528	<10	<91
IAOSIFW8	TM-14-67529	<10	<91
IAOSIFW9	TM-14-67530	43	393
IAOSIFW10**	TM-14-67531	<10	

AIHA LAP, LLC
ACCREDITED LABORATORY

Project 11750
Page 2 of 3

FOH ENVIRONMENTAL LABORATORY

636 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 888-0413 FAX: (312) 888-0434

Surface Wipe Sampling Criteria

Metal	Acceptable Surface Level µg/ft	Basis for Criteria
Cadmium	28	Brookhaven National Laboratory, Surface Wipe Sampling Procedure, Risk Assessment for Metals, IH75190 Rev 18 5/10/11
Chromium	6,970	Brookhaven National Laboratory, Surface Wipe Sampling Procedure, Risk Assessment for Metals, IH75190 Rev 18 5/10/11
Lead	250	EPA TSCA 40 CFR 745 and HUD Window Sills

Metals in Wipe Limits
(based on one ft^2 sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead	OSHA ID-121	5.0 $\mu g/ft^2$	10 $\mu g/ft^2$
Cadmium	OSHA ID-121	0.5 $\mu g/ft^2$	1.0 $\mu g/ft^2$
Chromium	OSHA ID-121	5.0 $\mu g/ft^2$	10 $\mu g/ft^2$

Non-Responsive

AIHA LAP, LLC ACCREDITED LABORATORY

Project 11750
Page 3 of 3

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312) 886-0413 Fax: (312) 886-0434

Non-Responsive

Non-Responsive

PROJECT REFERENCE

Agreement No.:	A	106644
Statement of Work No.:	S	180648
Project No:	P	189619
Agency		IAARNG
Proj. Manager		
Location (City, State):		Oskaloosa Former Indoor Firing Range, Oskaloosa, IA

For Lab Use Only
Project /Report #: 11750
Due Date: 5/7/14
Samples Received Chilled? YES / NO (circle one)
Conditions on Receipt with Name & Date

Water Sample Codes
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes*
STD- Standard
3D- Three Day Rush®
WH Weekend/Holiday*

Analysis Requested

Sample ID #	Type¹	Media²	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft²)	Water Volume (Liters)	Water Code³	Turn Around Time⁴	Lab ID #	LEAD	CADMIUM	CHROMIUM
IA05IFW1	7	5	4/25/14						100cm²				TM-M607522			
2	↓	↓	↓						↓				607523			
3													607524			
4													607525			
5													607526			
6													607527			
7													607528			
8													607529			
9													607530			
↓ 10	↓	↓	↓		Field Blank				-				607531	↓	↓	↓

¹Sample Type Codes: 1-Air 2-Water 3-Paint 4-Soil 5-Dust 6-Bulk 7-Wipe 8 - Other

²Sample Media Codes: 1-Charcoal 2-Matched Weight, 0.8um 3-PVC filter 4-M CE 0.8 um , 37 mm 5 -Ghost Wipes™ 6. Passive badge 7. Other

Non-Responsive

COMMENTS:

Applied to organic and inorganic analysis in cases of an emergency only. ® Applied to inorganic and organic samples, SD: Applied to organic and inorganic samples 7-10 business days.

National Guard Bureau
Mid-West Regional Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

ARNG-CSG-P October 15, 2014

MEMORANDUM FOR: The Adjutant General for Iowa

SUBJECT: Industrial Hygiene Survey at Mason City Armory, Mason City, Iowa

At the request of the National Guard Bureau (NGB) Mid-West Regional Industrial Hygiene (IH) Office, Non-Responsive, Certified Industrial Hygienist (CIH), conducted a survey on September 18, 2014 at the Iowa Army National Guard Mason City Armory, 1160 Southwest 19th Street, Mason City, Iowa. The site points of contact were Non-Responsive

The NGB conducted this survey in the interest of preventing employee illness and in meeting legal obligations where applicable. Based on information provided, every effort was made to conduct a comprehensive survey covering the parameters considered. Results and recommendations are based on information provided by site personnel, field measurements, and conditions observed during the survey. Changes in work practices and/or processes may change employee exposure levels. Use of different materials may result in exposure to a different air contaminant.

Occupational health risk assessment codes (RACs) are assigned to quantify health risks to personnel in accordance with DOD Letter of Instruction 6055.1, *DOD Safety and Occupational Health Program*. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. RAC descriptors are as follows: 1 = Critical, 2 = Serious, 3 = Moderate, 4 = Minor, and 5 = Negligible.

The Mason City Armory is the base of operations for the 1133rd Transportation Company. During the week, most of the activities at the armory involve administrative work. Site personnel reported that vehicle maintenance activities are mostly limited to fluid checks and tire changes on drill weekends, and that no major vehicle maintenance is performed at the armory. No vehicle maintenance was performed on the day of the survey. The Mason City Armory had an indoor firing range that was closed in 2013 and converted to a locker room. Weapons may be cleaned in the vault, in the supply room, or on tables set up on the drill floor.

The armory is available for rental for community activities that include: wedding receptions, dog shows, roller derby competitions, family reunions, photography studio use, and Christmas parties. The industrial hygiene survey included a walkthrough of the facility and interviews with employees.

Wipe samples were collected on representative surfaces in the facility and analyzed for lead. For purposes of this report, any results that exceed the guidelines adopted by the NGB Mid-West Regional IH Office are considered significant. None of the surface wipe sample results exceeded the guideline for lead. The following actions are required:

- **Clean the horizontal surfaces where lead may be present using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).**

- **Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).**
- **When weapons are cleaned, special attention should be given to cleaning up the work area to prevent potential lead contamination from ammunition (RAC 2).**

A lighting survey was conducted in the shops and offices in the Mason City Armory. Nine of the areas surveyed did not meet minimum illumination requirements. The following actions are required:

- **Increase the illumination levels in the facility areas that did not meet minimum illumination requirements (RAC 4).**

For any further questions, please contact Non-Responsive

Non-Responsive

Appendix	Title	Status
A.	Lead – Wipe Sampling	Attached
B.	Lighting	Attached

Appendix A
Lead – Wipe Sampling

Surface Area Wipe Samples

Wipe samples were collected from representative areas of the facility using Environmental Express Ghost™ Wipes and templates in accordance with the OSHA wipe sampling method (OSHA Technical Manual, Appendix II, 2-1). In addition, surface wipe samples were collected in the kitchen to assess migration of lead into food handling spaces. The samples were analyzed for lead by OSHA Method ID-121. The results and photos are contained in Table A-1.

The Occupational Safety and Health Administration (OSHA) requires that all surfaces must be kept as free as practicable of accumulations of toxic metal dusts (29 CFR 1910). In addition, DOD has instituted a new policy to minimize surface contamination levels of heavy metals (*Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations*, DTM 12-003, 18 April 2012).

The NGB Mid-West Regional IH Office has adopted the guidelines for metal dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges* and the Department of Energy (DOE)/ Brookhaven National Laboratory (BNL) *Surface Wipe Sampling Procedure* (IH75190). Any results that exceed these guidelines, which are shown in Table A-1, are considered significant. None of the surface wipe sample results exceeded the guideline for lead.

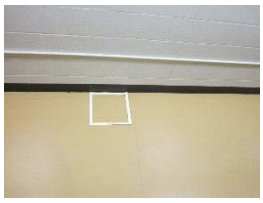
Recommendations:

1. Clean the horizontal surfaces where lead may be present by using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).

2. Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).

3. When weapons are cleaned, special attention should be given to cleaning up the work area to prevent potential lead contamination from ammunition (RAC 2).

Table A-1
Surface Area Wipe Sampling Results for Lead
Iowa Army National Guard
Mason City Armory
Mason City, Iowa
September 18, 2014

Sample #	Location	Photo	Lead ($\mu g/ft^2$)
Surface Guideline			**200**
IAMCAW1	Locker room, former IFR, behind firing line, northwest corner on floor		<10
IAMCAW2	Locker room, former IFR, near firing line, near south wall entrance on floor		17
IAMCAW3	Locker room, former IFR, midrange, near south wall on floor		<10
IAMCAW4	Locker room, former IFR, bullet trap area, southeast corner on floor		36
IAMCAW5	Locker room, former IFR, bullet trap area, northeast corner on floor		<10
IAMCAW6	Locker room, former IFR, near firing line, on top of exhaust duct		28

Sample #	Location	Photo	Lead ($\mu g/ft^2$)
Surface Guideline			**200**
IAMCAW7	Vault, on floor		15
IAMCAW8	Drill floor, center on floor		<10
IAMCAW9	Kitchen, on top of oven		53
IAMCAW10	Field blank	N/A	ND

Notes: 1) $\mu g/ft^2$ = micrograms per square foot of surface area. 2) ND = none detected. 3) "<" means less than the reporting limit for the analytical method.

Laboratory Result Reports and Chain of Custody Sheets

FOH ENVIRONMENTAL LABORATORY

538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead
Sampling Site: NGB: Mason City, IA (Armory)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 12123
DFOH Lab Nos.: TM-14-73089 through TM-14-73098
Date Received: 09/23/14
Data Analyzed: 10/02/14 – 10/03/14
Date Issued: 10/08/14

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200/400 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

Non-Responsive

AIHA LAP, LLC ACCREDITED LABORATORY

FOH ENVIRONMENTAL LABORATORY

636 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 888-0413 FAX: (312) 888-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IAMCAW1	TM-14-73089	<10	<10
IAMCAW2	TM-14-73090	17	17
IAMCAW3	TM-14-73091	<10	<10
IAMCAW4	TM-14-73092	36	36
IAMCAW5	TM-14-73093	<10	<10
IAMCAW6	TM-14-73094	28	28
IAMCAW7	TM-14-73095	15	15
IAMCAW8	TM-14-73096	<10	<10
IAMCAW9	TM-14-73097	53	53
IAMCAW10**	TM-14-73098	<10	

AGENCY	FLOORS	INTERIOR WINDOW SILLS	WINDOW TROUGHS
EPA	40 µg/ft²	250 µg/ft²	400 µg/ft²

Metals in Wipe Limits
(based on one ft² sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead – Flame AA	OSHA ID-121	5.0 µg/ft²	10 µg/ft²

Non-Responsive

AIHA LAP, LLC ACCREDITED LABORATORY

Project 12123
Page 2 of 2

1 of 1

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434

Non-Responsive

Contact Information
Nam
Add
Phon
Ema

Non-Responsive

PROJECT REFERENCE

Agreement No.:	A 106644
Statement of Work No.:	S 180648
Project No:	P 189649
Agency Proj. Manager	IAARNG
Location (City, State):	Mason City Armory Mason City, IA

For Lab Use Only
Project /Report #: 12/23
Due Date: 9/30/14
Samples Received Chilled? YES NO (circle one)
Conditions on Receipt with Name & Date
Rev. 07/2010

Water Sample Codes[1]
Container Types:
P-Plastic, G-Glass, V-VOC
Preservatives:
A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes[4]
STD- Standard
3D- Three Day Rush[5]
WH Weekend/Holiday*

Analysis Requested
Lead

Sample ID #	Type[1]	Media[2]	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code[3]	Turn Around Time[4]	Lab ID #
IAMCAW1	7	5	9/18/14						1				TM-M-73089
2													73090
3													73091
4													73092
5													73093
6													73094
7													73095
8													73096
9													73097
10					Field blank				-				73098

Sample Type Codes[1]
1-Air 2-Water 3-Paint 4-Soil 5-Dust 6-Bulk 7-Wipe 8 - Other

Sample Media Codes[2]
1-Charcoal 2-Matchec Weight, 0.8um 3-PVC filter 4-M CE 0.8 um , 37 mm 5 -Ghost Wipes™ 6. Passive badge 7. Other

Relinquished By: Non-Responsive Date & Time

COMMENTS: Wipes are 1 square foot ex

* Applied to organic and inorganic analysis in cases of an emergency only. [5] Applied to inorganic and organic samples, SD: Applied to organic and inorganic samples 7-10 business days.

Appendix B
Lighting

Illumination levels were measured with an Extech Instruments Model 407026 Light Meter calibrated according to the manufacturer's specifications. The results were compared with the recommendations in the National Guard Bureau Facility Design Guides and the American National Standards Institute/Illuminating Engineering Society of North America RP-1 (Offices) and RP-7 (Industrial Facilities) guidelines. The results and the lighting criteria are contained in Table B-1. Nine spaces in the facility did not meet the minimum lighting level.

Table B-1
Lighting Measurements
Iowa Army National Guard
Mason City Armory
Mason City, Iowa
September 18, 2014

Locations	Measured Illumination (foot candles)	Required Illumination (foot candles)	Standard Met?
Locker room	33-58	30	Yes
Vault	6-36	30	Partially
Room 121-1, Supply office	5-32	50	No
Supply area	5-23	30	No
Drill floor	18-41	50	No
Kitchen	52-72	50	Yes
Kitchen dish washing area	42-45	50	No
Room 103-105, Classroom	48-70	50	Partially
Mechanical room	7-30	30	Partially
Room 119, Office	22-43	50	No
Room 108, Computer room	46-80	50	Partially

Recommendations:

1. Increase the illumination levels in the facility areas that did not meet minimum illumination requirements (RAC 4).

National Guard Bureau
Mid-West Regional Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

ARNG-CSG-P June 25, 2014

MEMORANDUM FOR: The Adjutant General for Iowa

SUBJECT: Industrial Hygiene Survey at Oskaloosa Armory, Oskaloosa, Iowa

At the request of the National Guard Bureau (NGB) Mid-West Regional Industrial Hygiene (IH) Office, Non-Responsive, Certified Industrial Hygienist (CIH), conducted a survey on April 25, 2014 at the Iowa Army National Guard Oskaloosa Armory, 2260 Highway 63, Oskaloosa, Iowa. The site point of contact was Non-Responsive .

The NGB conducted this survey in the interest of preventing employee illness and in meeting legal obligations where applicable. Based on information provided, every effort was made to conduct a comprehensive survey covering the parameters considered. Results and recommendations are based on information provided by site personnel, field measurements, and conditions observed during the survey. Changes in work practices and/or processes may change employee exposure levels. Use of different materials may result in exposure to a different air contaminant.

Occupational health risk assessment codes (RACs) are assigned to quantify health risks to personnel in accordance with DOD Letter of Instruction 6055.1, *DOD Safety and Occupational Health Program*. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. RAC descriptors are as follows: 1 = Critical, 2 = Serious, 3 = Moderate, 4 = Minor, and 5 = Negligible.

The Oskaloosa Armory is the base of operations for the 3654th Maintenance Company. During the week, most of the activities at the armory involve administrative work. The Oskaloosa Armory had an indoor firing range that has been closed and converted to a locker room.

Site personnel reported that the maintenance bays and the cold storage building are utilized on drill weekends to perform a full range of vehicle maintenance for FMTVs, LMTVs, generators, bulldozers, construction equipment, graders, dump trucks, and other mobile equipment. No vehicle maintenance was performed on the day of the survey. The industrial hygiene survey included a walkthrough of the facility, local exhaust ventilation testing, and interviews with employees. The following actions are required:

- **Perform personal exposure monitoring on drill weekends to identify potential exposures to hazardous chemicals, noise and toxic dusts during maintenance activities (RAC 2).**

Wipe samples were collected on representative surfaces in the facility and analyzed for toxic metals. For purposes of this report, any results that exceed the guidelines adopted by the NGB Mid-West Regional IH Office are considered significant. Three of the surface wipe sample results exceeded the guideline for cadmium. A sample collected on a workbench in the east maintenance bay had a cadmium concentration of 88 µg/ft^2. A sample collected on a workbench in the west end of the cold storage building had a cadmium concentration of 33 µg/ft^2. A sample collected on a workbench in the east end of the cold storage building had a cadmium concentration of 107 µg/ft^2. The following actions are required:

- **Clean the horizontal surfaces where toxic metals may be present using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).**
- **Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).**

A lighting survey was conducted in the shops and offices in the Oskaloosa Armory. Nine of the areas surveyed did not meet minimum illumination requirements. The following actions are required:

- **Increase the illumination levels in the facility areas that did not meet minimum illumination requirements (RAC 4).**

A local exhaust ventilation survey was conducted for the tailpipe exhaust systems and the battery charging room. The battery charging room did not meet minimum guidelines. The following actions are required:

- **Carbon monoxide detection and alarm systems should be installed in the maintenance bay areas to warn employees of the presence of elevated levels of carbon monoxide (RAC 2).**
- **The exhaust ventilation in the battery room should be repaired, then it should be tested to ensure that it meets the NGB Design Guides 415-2 &3 for a complete change of air within the room at least twelve times per hour (12 ACH) (RAC 2).**

For any further questions, please contact Non-Responsive

Non-Responsive

Appendix	Title	Status
A.	Metals – Wipe Sampling	Attached
B.	Lighting	Attached
C.	Ventilation	Attached

Appendix A
Metals – Wipe Sampling

Surface Area Wipe Samples

Wipe samples were collected from representative areas of the facility using Environmental Express Ghost™ Wipes and templates in accordance with the OSHA wipe sampling method (OSHA Technical Manual, Appendix II, 2-1). The samples were analyzed for toxic metals by OSHA Method ID-121. The results and photos are contained in Table A-1.

The Occupational Safety and Health Administration (OSHA) requires that all surfaces must be kept as free as practicable of accumulations of toxic metal dusts (29 CFR 1910). In addition, DOD has instituted a new policy to minimize surface contamination levels of heavy metals (*Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations*, DTM 12-003, 18 April 2012).

The NGB Mid-West Regional IH Office has adopted the guidelines for metal dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges* and the Department of Energy (DOE)/ Brookhaven National Laboratory (BNL) *Surface Wipe Sampling Procedure* (IH75190). Any results that exceed these guidelines, which are shown in Table A-1, are considered significant. Three of the surface wipe sample results exceeded the guideline for cadmium. Sample IAOSMW2, which was collected on a workbench in the east maintenance bay, had a cadmium concentration of 88 µg/ft^2. Sample IAOSMW4, which was collected on a workbench in the west end of the cold storage building, had a cadmium concentration of 33 µg/ft^2. Sample IAOSMW5, which was collected on a workbench in the east end of the cold storage building, had a cadmium concentration of 107 µg/ft^2.

Table A-1
Surface Area Wipe Sampling Results for Toxic Metals
Iowa Army National Guard
Oskaloosa Armory and Cold Storage Building
Oskaloosa, IA
April 25, 2014

Sample #	Location	Photo	Lead (µg/ft^2)	Cadmium (µg/ft^2)	Chromium (µg/ft^2)
Surface Guideline			**200**	**28**	**6,970**
IAOSMW1	West Maintenance bay, on workbench		<91	27	<91
IAOSMW2	East Maintenance bay, on workbench		<91	**88**	<91

Sample #	Location	Photo	Lead ($\mu g/ft^2$)	Cadmium ($\mu g/ft^2$)	Chromium ($\mu g/ft^2$)
Surface Guideline			**200**	**28**	**6,970**
IAOSMW3	East Maintenance bay, on flammable liquid storage		130	13	98
IAOSMW4	West end of cold storage building, on workbench		<91	**33**	<91
IAOSMW5	East end of cold storage building, on workbench		<91	**107**	310
IAOSMW6	Field blank	N/A	ND	ND	ND

Notes: 1) $\mu g/ft^2$ = micrograms per square foot of surface area. 2) ND = none detected. 3) "<" means less than the reporting limit for the analytical method.

Recommendations:

1. Clean the horizontal surfaces where toxic metals may be present by using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).

2. Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).

Laboratory Result Reports and Chain of Custody Sheets

FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead, Cadmium and Chromium
Sampling Site: NGB: Oskaloosa, IA (Armory)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 11749
DFOH Lab Nos.: TM-14-67516 through TM-14-67521
Date Received: 04/30/14
Data Analyzed: 04/30/14 – 05/01/14
Date Issued: 05/05/14

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

FOH ENVIRONMENTAL LABORATORY
638 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 888-0413 FAX: (312) 888-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IAOSMW1	TM-14-67516	<10	<91
IAOSMW2	TM-14-67517	<10	<91
IAOSMW3	TM-14-67518	14	130
IAOSMW4	TM-14-67519	<10	<91
IAOSMW5	TM-14-67520	<10	<91
IAOSMW6**	TM-14-67521	<10	

CADMIUM on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IAOSMW1	TM-14-67516	3.0	27
IAOSMW2	TM-14-67517	9.7	88
IAOSMW3	TM-14-67518	1.4	13
IAOSMW4	TM-14-67519	3.7	33
IAOSMW5	TM-14-67520	12	107
IAOSMW6**	TM-14-67521	<1.0	

CHROMIUM on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IAOSMW1	TM-14-67516	<10	<91
IAOSMW2	TM-14-67517	<10	<91
IAOSMW3	TM-14-67518	11	98
IAOSMW4	TM-14-67519	<10	<91
IAOSMW5	TM-14-67520	34	310
IAOSMW6**	TM-14-67521	<10	

Surface Wipe Sampling Criteria

Metal	Acceptable Surface Level µg/ft	Basis for Criteria
Cadmium	28	Brookhaven National Laboratory, Surface Wipe Sampling Procedure, Risk Assessment for Metals, IH75190 Rev 18 5/10/11
Chromium	6,970	Brookhaven National Laboratory, Surface Wipe Sampling Procedure, Risk Assessment for Metals, IH75190 Rev 18 5/10/11
Lead	250	EPA TSCA 40 CFR 745 and HUD Window Sills

AIHA LAP, LLC ACCREDITED LABORATORY

Project 11749
Page 2 of 3

FOH ENVIRONMENTAL LABORATORY

636 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 888-0413 FAX: (312) 888-0434

Metals in Wipe Limits
(based on one ft^2 sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead	OSHA ID-121	5.0 µg/ft^2	10 µg/ft^2
Cadmium	OSHA ID-121	0.5 µg/ft^2	1.0 µg/ft^2
Chromium	OSHA ID-121	5.0 µg/ft^2	10 µg/ft^2

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

Project 11749
Page 3 of 3

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434
Attn: Michelle Stemmons

[redacted]

PROJECT REFERENCE

Agreement No.:	A	1066441
Statement of Work No.:	S	180648
Project No:	P	189679
Agency		IAARNG
Proj. Manager		
Location (City, State):		Oskaloosa Armory Maintenance + Cold Storage Oskaloosa IA

For Lab Use Only
Project /Report #: 11749
Due Date: 5/7/14
Samples Received Chilled? YES NO (circle one)
Conditions on Receipt with Name & Date

Rev. 07/2010

Water Sample Codes
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes
STD- Standard
3D- Three Day Rush[3]
WH Weekend/Holiday[4]

Analysis Requested
LEAD
CADMIUM
CHROMIUM

Sample ID #	Type[1]	Media[2]	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code[3]	Turn Around Time[4]	Lab ID #
IAOSMW1	7	5	4/25/14						100cm²				TM-14-67516
2	↓	↓	↓						↓				67517
3													67518
4													67519
5													67520
6					Field Blank				-				67521

Sample Type Codes: 1-Air 2-Water 3-Paint 4-Soil 5-Dust 6-Bulk 7-Wipe 8-Other

Sample Media Codes: 1-Charcoal 2-Matched Weight, 0.8um 3-PVC filter 4-M CE 0.8 um, 37 mm 5-Ghost Wipes™ 6. Passive badge 7. Other

Relinquished by: [redacted]

COMMENTS:

[1] Applied to organic and inorganic analysis in cases of an emergency only. [2] Applied to inorganic and organic samples. [3] Applied to organic and inorganic samples 7-10 business days.

Appendix B
Lighting

Illumination levels were measured with an Extech Instruments Model 407026 Light Meter calibrated according to the manufacturer's specifications. The results were compared with the recommendations in the National Guard Bureau Facility Design Guides and the American National Standards Institute/Illuminating Engineering Society of North America RP-1 (Offices) and RP-7 (Industrial Facilities) guidelines. The results and the lighting criteria are contained in Table B-1. Nine spaces in the facility did not meet the minimum lighting level.

Table B-1
Lighting Measurements
Iowa Army National Guard
Oskaloosa Armory
Oskaloosa, IA
April 25, 2014

Locations	Measured Illumination (foot candles)	Required Illumination (foot candles)	Standard Met?
West Maintenance bay	27-65	50	Partially
East Maintenance bay	15-66	50	Partially
Room 140, Maintenance shop office	32-45	50	No
Dispatch office	49-52	50	Partially
Library	1-12	50	No
Battery charging room	20-28	30	No
Cold storage building, west end	6-12	30	No
Cold storage building, center	3-13	30	No
Cold storage building, east end	5-25	30	No

Recommendations:

1. Increase the illumination levels in the facility areas that did not meet minimum illumination requirements (RAC 4).

Appendix C
Ventilation

A TSI Alnor Model AVM430A thermal anemometer, calibrated according to the manufacturer's specifications, was used to evaluate local exhaust ventilation systems at this facility. Ventilation rates were compared to criteria established by the American Conference of Governmental Industrial Hygienists (ACGIH) *Industrial Ventilation, A Manual of Recommended Practice for Design* and the Occupational Safety and Health Administration (OSHA).

Carbon Monoxide Detection Systems

Carbon monoxide is an odorless, colorless toxic gas that is a product of incomplete combustion. Maintenance activities require personnel to run engines while they are in the maintenance bays. During the winter months, maintenance is performed with the bay doors closed. The maintenance bays were not equipped with carbon monoxide gas detectors. Carbon monoxide detection and alarm systems should be installed in the maintenance bay areas to warn employees of the presence of elevated levels of carbon monoxide.

Tailpipe Local Exhaust Ventilation (LEV) Systems

The facility is equipped with two overhead tailpipe exhaust systems (Figure C-1) that provide service to each maintenance bay. The tailpipe LEV systems had ten inch diameter flexible exhaust ducts. Site personnel reported that the maintenance bays and the cold storage building are utilized on drill weekends to perform a full range of vehicle maintenance for FMTVs, LMTVs, generators, bulldozers, construction equipment, graders, dump trucks, and other mobile equipment. No vehicle maintenance was performed on the day of the survey.

Air velocity measurements were collected at the face of each exhaust hood. The airflow rates for the tailpipe exhaust systems are presented in Table C-1. Both of the tailpipe exhaust systems met the minimum airflow rate of 800 cubic feet per minute (cfm) required by the NGB Mid-West Regional IH Office in accordance with the ACGIH formulae for tailpipe exhaust ventilation volumes (VS-85-2) for vehicles that have diesel engine displacements ranging up to 0.426 ft^3 (736 in^3).

Table C-1
Tailpipe Exhaust System Ventilation Measurements
Iowa Army National Guard
Oskaloosa Armory
Oskaloosa, IA
April 25, 2014

Exhaust System	Exhaust Hood Diameter (inches)	Velocity (fpm)	Airflow Rate (cfm)	Requirement (cfm)	Standard Met?
West bay	12	1,410	1,107	800	Yes
East bay	12	1,334	1,047	800	Yes

Notes: 1) fpm = feet per minute. 2) cfm = cubic feet per minute.

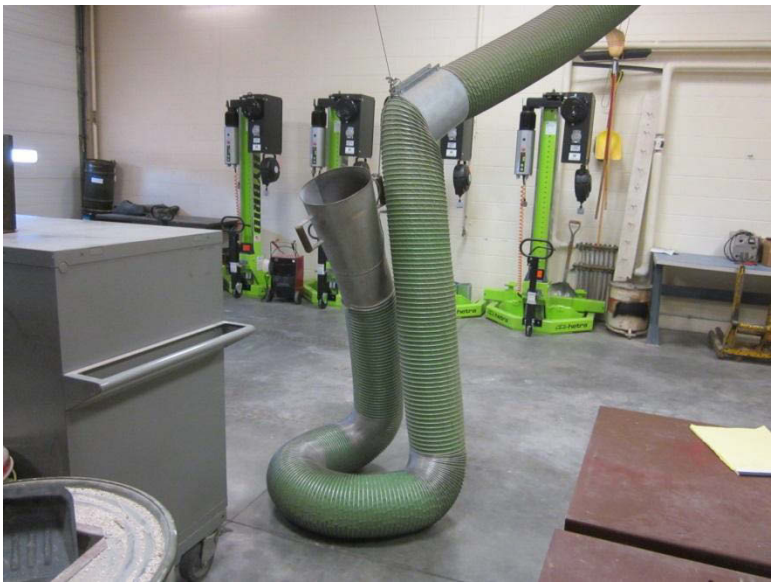


Figure C-1. Tailpipe Exhaust System.

Other Local Exhaust Ventilation Systems

Other local exhaust ventilation system evaluation results for this facility are shown in Table C-2. Ventilation measurements were collected in the battery charging room. The exhaust ventilation system was inoperable and could not be tested. The exhaust ventilation system in the battery charging room should be repaired and tested to ensure that it meets the NGB Design Guides 415-2 &3 for a complete change of air within the room at least twelve times per hour (12 ACH).

Table C-2
Local Exhaust Ventilation Measurements
Iowa Army National Guard
Oskaloosa Armory
Oskaloosa, IA
April 25, 2014

Location	Photo	Dimensions	Duct Area (ft^2)	Average Velocity (fpm)	Exhaust Flow Rate (cfm)	Result	Requirement	Standard Met?
Battery Room		Room is 20’ x 11’ x 12’ Duct is 11” x 11”	0.84	0	0	Inoperable	12 ACH (NGB DG 415-2&3)	No

Notes: 1) fpm = feet per minute. 2) cfm = cubic feet per minute. 3) ACH = air changes per hour.

Recommendations:

1. Carbon monoxide detection and alarm systems should be installed in the maintenance bay areas to warn employees of the presence of elevated levels of carbon monoxide (RAC 2).
2. The exhaust ventilation in the battery room should be repaired, then it should be tested to ensure that it meets the NGB Design Guides 415-2 &3 for a complete change of air within the room at least twelve times per hour (12 ACH) (RAC 2).

National Guard Bureau
Mid-West Regional Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

ARNG-CSG-P October 15, 2014

MEMORANDUM FOR: The Adjutant General for Iowa

SUBJECT: Industrial Hygiene Survey at Sioux City Armory, Sioux City, Iowa

At the request of the National Guard Bureau (NGB) Mid-West Regional Industrial Hygiene (IH) Office, Non-Responsive, Certified Industrial Hygienist (CIH), conducted a survey on September 17, 2014 at the Iowa Army National Guard Sioux City Armory, 4200 Remington Drive, Sioux City, Iowa. The site point of contact was Non-Responsive.

The NGB conducted this survey in the interest of preventing employee illness and in meeting legal obligations where applicable. Based on information provided, every effort was made to conduct a comprehensive survey covering the parameters considered. Results and recommendations are based on information provided by site personnel, field measurements, and conditions observed during the survey. Changes in work practices and/or processes may change employee exposure levels. Use of different materials may result in exposure to a different air contaminant.

Occupational health risk assessment codes (RACs) are assigned to quantify health risks to personnel in accordance with DOD Letter of Instruction 6055.1, *DOD Safety and Occupational Health Program*. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. RAC descriptors are as follows: 1 = Critical, 2 = Serious, 3 = Moderate, 4 = Minor, and 5 = Negligible.

The Sioux City Armory is the base of operations for HHT, 1st 113th Cavalry, Delta Company 334 BSB, and Detachment 1 2168th Transportation Company. During the week, most of the activities at the armory involve administrative work. Site personnel reported that vehicle maintenance activities are mostly limited to fluid checks and tire changes on drill weekends, and that no major vehicle maintenance is performed at the armory. No vehicle maintenance was performed on the day of the survey. Site personnel reported that the Sioux City Armory had an indoor firing range (IFR) that was closed and converted to a weight room and EST training room. Weapons may be cleaned in the vault, in the supply room, or on tables set up on the drill floor.

The armory is available for rental for community activities that include: wedding receptions, family reunions, tool sales, and elementary school wrestling team practice. The industrial hygiene survey included a walkthrough of the facility and interviews with employees.

Wipe samples were collected on representative surfaces in the facility and analyzed for lead. For purposes of this report, any results that exceed the guidelines adopted by the NGB Mid-West Regional IH Office are considered significant. One of the surface wipe sample results exceeded the guideline for lead. Sample IASCAW3, which was collected on the floor adjacent to the west wall in the EST 2000 room, midrange in the former indoor firing range, had a lead concentration of 604 $\mu g/ft^2$. The following actions are required:

- **Clean the horizontal surfaces where lead may be present using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).**
- **Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).**
- **When weapons are cleaned, special attention should be given to cleaning up the work area to prevent potential lead contamination from ammunition (RAC 2).**

A lighting survey was conducted in the shops and offices in the Sioux City Armory. Six of the areas surveyed did not meet minimum illumination requirements. The following actions are required:

- **Increase the illumination levels in the facility areas that did not meet minimum illumination requirements (RAC 4).**

For any further questions, please contact Non-Responsive

Non-Responsive

Appendix	Title	Status
A.	Lead – Wipe Sampling	Attached
B.	Lighting	Attached

Appendix A
Lead – Wipe Sampling

Surface Area Wipe Samples

Wipe samples were collected from representative areas of the facility using Environmental Express Ghost™ Wipes and templates in accordance with the OSHA wipe sampling method (OSHA Technical Manual, Appendix II, 2-1). In addition, surface wipe samples were collected in the kitchen to assess migration of lead into food handling spaces. The samples were analyzed for lead by OSHA Method ID-121. The results and photos are contained in Table A-1.

The Occupational Safety and Health Administration (OSHA) requires that all surfaces must be kept as free as practicable of accumulations of toxic metal dusts (29 CFR 1910). In addition, DOD has instituted a new policy to minimize surface contamination levels of heavy metals (*Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations*, DTM 12-003, 18 April 2012).

The NGB Mid-West Regional IH Office has adopted the guidelines for metal dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges* and the Department of Energy (DOE)/ Brookhaven National Laboratory (BNL) *Surface Wipe Sampling Procedure* (IH75190). Any results that exceed these guidelines, which are shown in Table A-1, are considered significant. One of the surface wipe sample results exceeded the guideline for lead. Sample IASCAW3, which was collected on the floor adjacent to the west wall in the EST 2000 room, midrange in the former indoor firing range, had a lead concentration of 604 $\mu g/ft^2$.

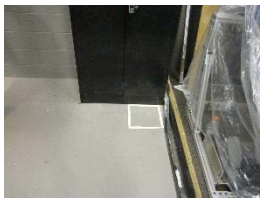
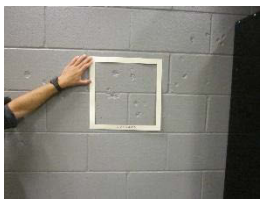
Recommendations:

1. Clean the horizontal surfaces where lead may be present by using high-efficiency particulate air (HEPA) filter vacuums or wet methods (RAC 2).

2. Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items (RAC 3).

3. When weapons are cleaned, special attention should be given to cleaning up the work area to prevent potential lead contamination from ammunition (RAC 2).

Table A-1
Surface Area Wipe Sampling Results for Lead
Iowa Army National Guard
Sioux City Armory
Sioux City, Iowa
September 17, 2014

Sample #	Location	Photo	Lead ($\mu g/ft^2$)
Surface Guideline			**200**
IASCAW1	Fitness room, former IFR, at firing line entrance, beneath rubber mats on floor		146
IASCAW2	Fitness room, former IFR, on east side of firing line area, beneath rubber mats on floor		15
IASCAW3	EST 2000 room, former IFR, midrange, on floor adjacent to west wall		**604**
IASCAW4	EST 2000 room, former IFR at bullet trap, northeast corner of storage area, on floor		48
IASCAW5	EST 2000 room, former IFR at bullet trap, along north wall, on floor		68
IASCAW6	EST 2000 room, former IFR at bullet trap, on north wall		33

Sample #	Location	Photo	Lead ($\mu g/ft^2$)
Surface Guideline			**200**
IASCAW7	North vault, on table top		10
IASCAW8	South vault, on floor		55
IASCAW9	Kitchen, on center food prep table		<10
IASCAW10	Field blank	N/A	ND

Notes: 1) $\mu g/ft^2$ = micrograms per square foot of surface area. 2) ND = none detected. 3) "<" means less than the reporting limit for the analytical method.

Laboratory Result Reports and Chain of Custody Sheets

FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention:

Submitted By: Non-Responsive

Reference Data: Lead
Sampling Site: NGB: Sioux City, IA (Armory)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 12072
DFOH Lab Nos.: TM-14-72630 through TM-14-72639
Date Received: 09/19/14
Data Analyzed: 09/22/14 – 09/23/14
Date Issued: 09/24/14

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame and/or Perkin Elmer 600 furnace atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

Non-Responsive

AIHA LAP, LLC ACCREDITED LABORATORY

FOH ENVIRONMENTAL LABORATORY

636 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
IASCAW1	TM-14-72630	146	146
IASCAW2	TM-14-72631	15	15
IASCAW3	TM-14-72632	604	604
IASCAW4	TM-14-72633	48	48
IASCAW5	TM-14-72634	68	68
IASCAW6	TM-14-72635	33	33
IASCAW7	TM-14-72636	10	10
IASCAW8	TM-14-72637	55	55
IASCAW9	TM-14-72638	<10	<10
IASCAW10**	TM-14-72639	<10	

AGENCY	FLOORS	INTERIOR WINDOW SILLS	WINDOW TROUGHS
EPA	40 µg/ft²	250 µg/ft²	400 µg/ft²

Metals in Wipe Limits
(based on one ft² sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead – Flame AA	OSHA ID-121	5.0 µg/ft²	10 µg/ft²

Non-Responsive

AIHA LAP, LLC ACCREDITED LABORATORY

Project 12072
Page 2 of 2

1 of 1

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434
Non-Responsive

Contact Information
Name: Non-Responsive
Address:
Phone/
Email:

PROJECT REFERENCE
Agreement No.: A 106644
Statement of Work No.: S 180648
Project No: P 189649
Agency Proj. Manager: IAARNG
Location (City, State): Sioux City Armory Sioux City, IA

For Lab Use Only
Project /Report #: 12072
Due Date: 9/26/14
Samples Received Chilled? YES NO (circle one)
Conditions on Receipt with Name & Date
Rev. 07/2010

Water Sample Codes*
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes*
STD- Standard
3D- Three Day Rush®
WH Weekend/Holiday*

Analysis Requested
Lead

Sample ID #	Type*	Media*	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code*	Turn Around Time*	Lab ID #
IASCAW1	7	5	9/17/14						1				TM-14-72630
2													72631
3													72632
4													72633
5													72634
6													72635
7													72636
8													72637
9									↓				72638
↓ 10	↓	↓	↓		Field blank				-				↓ 72639

Sample Type Codes*
1-Air 2-Water 3-Paint 4-Soil 5-Dust 6-Bulk 7-Wipe 8 - Other

Sample Media Codes*
1-Charcoal 2-Matched Weight, 0.8um 3-PVC filter 4-M CE 0.8 um , 37 mm 5 -Ghost Wipes™ 6. Passive badge 7. Other

Relinquished By	Date & Time	Received By	Date & Time
Non-Responsive			

COMMENTS: 1 square foot samples

* Applied to organic and inorganic analysis in cases of an emergency only. ® Applied to inorganic and organic samples. SD: Applied to organic and inorganic samples 7-10 business days.

Appendix B
Lighting

Illumination levels were measured with an Extech Instruments Model 407026 Light Meter calibrated according to the manufacturer's specifications. The results were compared with the recommendations in the National Guard Bureau Facility Design Guides and the American National Standards Institute/Illuminating Engineering Society of North America RP-1 (Offices) and RP-7 (Industrial Facilities) guidelines. The results and the lighting criteria are contained in Table B-1. Six spaces in the facility did not meet the minimum lighting level.

Table B-1
Lighting Measurements
Iowa Army National Guard
Sioux City Armory
Sioux City, Iowa
September 17, 2014

Locations	Measured Illumination (foot candles)	Required Illumination (foot candles)	Standard Met?
Fitness room	33-54	50	Partially
EST 2000 room	15-27	30	No
North vault	75-88	30	Yes
Supply vault	78-83	30	Yes
Trans office	74-96	50	Yes
South vault	156-163	30	Yes
Kitchen	69-80	50	Yes
Room 129.1, Office	36-65	50	Partially
Drill floor	19-24	50	No
Break room	38-56	30	Yes
Supply room	21-44	30	Partially
Orderly room	54-66	50	Yes
Classroom	35-67	50	Partially

Recommendations:

1. Increase the illumination levels in the facility areas that did not meet minimum illumination requirements (RAC 4).

Surface Lead Monitoring Survey

At

Iowa Army National Guard
Armory
Waterloo, Iowa

Survey date: April 24, 2013

For

Department of the Army
National Guard Bureau
Region West Industrial Hygiene Office
NGB-AVN-S1

Performed by

U.S. Public Health Service
Federal Occupational Health
Denver, Colorado

June 20, 2013

Table of Contents

Appendices

I. Executive Summary

At the request of the National Guard Bureau Region West Industrial Hygiene Office, field personnel representing the U.S. Public Health Service, Federal Occupational Health conducted surface lead monitoring at the Iowa Army National Guard Army, Waterloo Armory located in Waterloo, Iowa. This survey was conducted in order to identify lead levels on surfaces within the facility.

The armory consists of a drill room or assembly hall, offices, classrooms, locker room, kitchen, and break room. It was reported that a firing range did exist in the building but it has been closed for over 20 years and the area renovated. Weapons are cleaned in the Drill room. The Drill room is rented to the public for special events such as tool sales, wedding receptions, and graduations. It is possible that children are present for some of the events.

Nine surface wipe samples were collected and analyzed for lead contamination in the facility. All nine samples were below the NGB Industrial Hygiene recommended surface limit of 200 ug lead/ft^2 for areas occupied by Guard personnel. One sample collected in the Drill room on the upper ledge was above the NGB Industrial Hygiene recommend surface limit of 40 ug lead/ft^2 for areas occupied by children.

Since children are allowed into the Drill room several times per year, all surfaces within the Drill room should have surface lead levels below 40 ug/ft^2. The dust layer on the upper ledge can be disturbed by air movement resulting in dust being deposited on the Drill room floor. The upper surfaces of the Drill room need to be cleaned to prevent lead exposure to the public. (RAC 2)

II. Introduction

Monitoring of lead on workplace surfaces was conducted by the U.S. Public Health Service (USPHS) Federal Occupational Health (FOH) at the Iowa Army National Guard Army, Waterloo Armory located in Waterloo, Iowa. This work was conducted under the Interagency Agreement between the USPHS, FOH and the West Region of the Army National Guard. Non-Responsive Certified Industrial Hygienist conducted this survey on April 24, 2013.

The purpose of the site visit was to collect surface wipe samples in the building for the evaluation of lead contamination. FOH conducted this survey in the interest of preventing employee illness and in meeting legal obligations where applicable. Based on information provided, every effort was made to conduct a comprehensive survey covering the parameters considered. Results and recommendations are based on information provided, field measurements, and conditions observed during the survey.

III. Site Description

The armory consists of a drill room or assembly hall, offices, classrooms, locker room, kitchen, and break room. It was reported that a firing range did exist in the building but it has been closed for over 20 years and the area renovated. Weapons are cleaned in the Drill room. The Drill room is rented to the public for special events such as tool sales, wedding receptions, and graduations. It is possible that children are present for some of the events.

IV. Assessment Criteria

NBG Industrial Hygiene has adopted the sampling procedures and recommended limits for lead dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion on Indoor Firing Ranges*, November 3, 2006. For purposes of this report, any surface lead level that exceeds 200 micrograms per square foot (ug/ft^2) in the facility is considered significant. NG Pam 420-15 may be found at: http://www.ngbpdc.ngb.army.mil/pubs/420/ngpam420_15.pdf.

Also, the NGB-ARS Memorandum for the Chiefs of Staff dated February 2, 2006 provides guidance for potential lead hazard exposure in Army National Guard child occupied facilities. The memorandum defines a child occupied facility as a building, or portion of a building, visited on a regular basis by the same child, six years of age or under. Child occupied facilities may include, but are not limited to, day-care centers, preschools, and kindergarten classrooms. The memorandum states that, “For all areas used/occupied on a regular basis by children ages six and under clean all floors

accessible to said children to the EPA dust-lead standard of 40 ug/ft^2. For purposes of this report any surface lead level that exceeds 40 ug/ft^2 in a child occupied area is considered significant.

V. Findings, Discussion, and Recommendations

Wipe Sampling Method

Surface samples were collected using Environmental Express Ghost Wipes. Surface wipe templates that encompassed either 1 square foot (child occupied areas) or 0.11 square foot (other work areas) of surface area were used to collect samples. For each surface sample collected, a new set of gloves and a new numbered template was used. The entire template area was wiped using an "S" configured motion. The wipe was then folded in half and the template area was wiped using an "S" motion in a direction perpendicular to the first. The wipe was folded again and the perimeter of the area was wiped. The wipe was placed into a plastic tube, capped, and the samples were sent to the FOH Laboratory in Chicago, Illinois. Samples were hot plate digested and analyzed for lead with a Perkin Elmer 200 fame atomic absorption spectrophotometer using the OSHA ID-121 Analytical Method.

Surface Wipe Samples

Nine surface wipe samples were collected and analyzed for lead contamination in the facility (Figures 1 - 9). All nine samples were below the NGB Industrial Hygiene recommended surface limit of 200 ug lead/ft^2 for areas occupied by Guard personnel. One sample collected in the Drill room on the upper ledge (Figure 1) was above the NGB Industrial Hygiene recommend surface limit of 40 ug lead/ft^2 for areas occupied by children. The results are contained in Table 1.

Table 1
Area Wipe Sampling Results for Lead
Iowa Army National Guard
Waterloo, Iowa
April 24, 2013

Sample Number	Location	Lead ug/ft^2
1	Drill Floor on upper ledge	**50**
2	Kitchen on ice machine	<10
3	Drill Room on floor NW	<10
4	Drill Room on floor	<10
5	Break room on microwave	<91
6	S-1 shop – office on black metal file cabinet	<91
7	Upstairs classroom on window sill	<91
8	Copy room on desk	<91
9	HHC order room 202 on desk	<91
10	blank	ND

Note: 1) ug/ft^2= micrograms per square foot of surface area. 2) **Bold** indicates that concentration was "significant."

Recommendations

Since children are allowed into the Drill room several times per year, all surfaces within the Drill room should have surface lead levels below 40 ug/ft^2. The dust layer on the upper ledge can be disturbed by air movement resulting in dust being deposited on the Drill room floor. The upper surfaces of the Drill room need to be cleaned to prevent lead exposure to the public. (RAC 2)

Figure 1 – Wipe sample 1

Figure 2 – Wipe sample 2

Figure 3 – Wipe sample 3

Figure 4 – Wipe sample 4

Figure 5 – Wipe sample 5

Figure 6 – Wipe sample 6

Figure 7 – Wipe sample 7

Figure 8 – Wipe sample 8

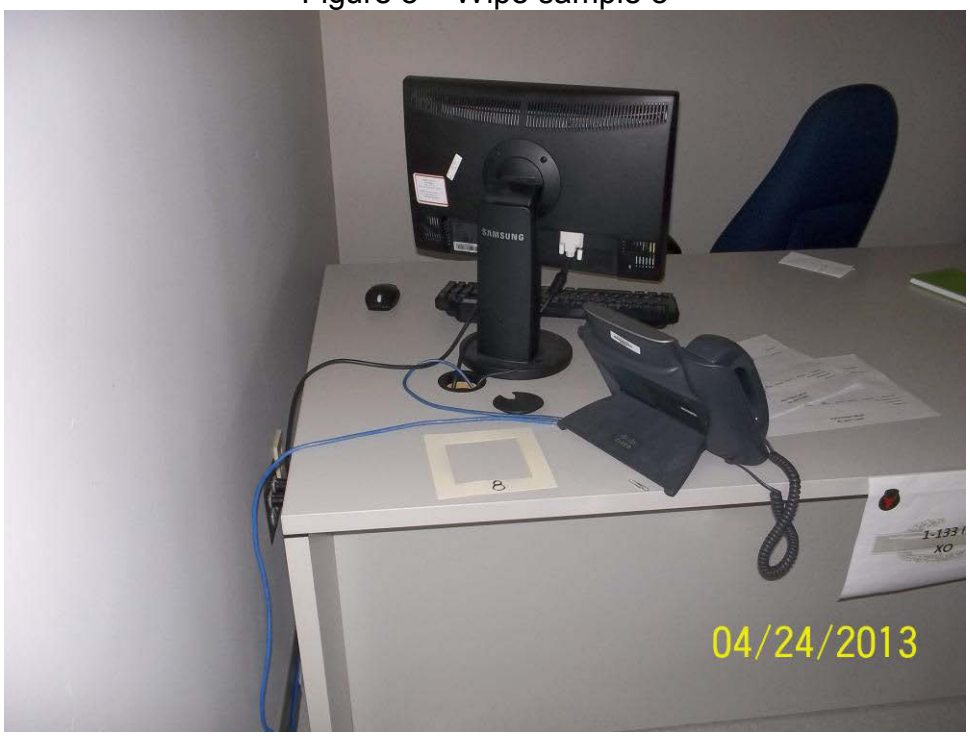


Figure 9 – Wipe sample 9

Technical Assistance: This report was written by Non-Responsive as a representative of FOH, USPHS. Non-Responsive, Regional Industrial Hygienist at the NGB Region West Industrial Hygiene Office, reviewed and approved this report. For technical assistance regarding information found in this report or the performed survey, please contact Non-Respo [redacted].

Reviewed by:

Non-Responsive

Non-Responsive

Appendix A

Iowa Army National Guard State Points of Contact

Non-Responsive

Armory Point of Contact

Non-Responsive

Non-Responsive

Appendix B

FOH ENVIRONMENTAL LABORATORY

536 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead

Sampling Site:	NGB: Waterloo, IA (Armory)
Sample Media:	Ghost Wipe(s)®
Method Reference:	OSHA ID-121
Project ID:	Project 11111
DFOH Lab Nos.:	TM-13-61004 through TM-13-61013
Date Received:	05/07/13
Data Analyzed:	05/10/13 - 05/13/13
Date Issued:	05/16/13

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

FOH ENVIRONMENTAL LABORATORY

536 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
1	TM-13-61004	50	50
2	TM-13-61005	<10	<10
3	TM-13-61006	<10	<10
4	TM-13-61007	<10	<10
5	TM-13-61008	<10	<91
6	TM-13-61009	<10	<91
7	TM-13-61010	<10	<91
8	TM-13-61011	<10	<91
9	TM-13-61012	<10	<91
10**	TM-13-61013	<10	

Surface Wipe Sampling Criteria

Metal	Acceptable Surface Level µg/ft²	Basis for Criteria
Lead	250	EPA TSCA 40 CFR 745 and HUD Window Sills

Metals in Wipe Limits
(based on one ft² sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead	OSHA ID-121	5.0 µg/ft²	10 µg/ft²

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

Project 11111
Page 2 of 2

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434

PROJECT REFERENCE
Agreement No.: A 106644
Statement of Work No.: S 167033
Project No: P 167034
Agency/Project Name: ARNG Waterloo Armory
Location (City, State): Waterloo, IA

For Lab Use Only
Project /Report #: 167033
Due Date: 5/13/13
Samples Received Chilled? YES NO (circle one)

Conditions on Receipt with Name & Date

Contact Information
Name: [redacted]
Address: [redacted]
Phone: [redacted]
Email: [redacted]

Water Sample Codes*: Container Types: P-Plastic, G-Glass, V-VOC; Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes*: STD- Standard; R- Rush*; 2D- Two Day Rush*; ND- Next Day Rush*; SD- Same Day Rush*; WH- Weekend/Holiday*

ID #	Sample Type*	Sample Media*	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (in^2)	Water Volume (Liters)	Water Code*	Turn Around Time*	Lab ID #	Analysis Requested
1	7	12	April 24						144			STD	DM-13-610045	Lead
2									144				610055	
3									144				610066	
4									144				610077	
5									16				610088	
6									16				610099	
7									16				610100	
8									16				610111	
9									16				610122	
10									1				610133	

Sample Type Codes*: 1-Air 2-Water 3-Paint 4-Soil 5-Dust 6-Bulk 7-Wipe 8-Contact Plate 9-Tape 10-Spore Trap (Zefon & others) 11-Other

Sample Media Codes*: 1-Charcoal 2-XAD 3-Matched Weight 4-Preweighted 5-MEA 6-CCA 7-R2A/TSA 8-Air-O-Cell Cassette 9-MCE Cassette (0.45) 10-MCE Cassette (0.8) 11-MCE Filter 12-Other

Relinquished By / Date & Time: [redacted]

Received By / Date & Time: [redacted]

COMMENTS:

* Applied to non-viable microbiological samples only. Applied to asbestos samples, SD: 2-hour PLM/PCM, 6-hour TEM; ND: 24-hour; R: 3-5 business days.

Appendix C

Occupational Health Risk Assessment Codes
(Reference: DOD Letter of Instructions 6055 1)

Occupational health risk assessment codes (RACs) are included in this report to quantify health risks to personnel risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel The following procedure is used to determine the RACs:

STEP 1: This step assesses points to determine the health hazard severity category (HHSC) The HHSC reflects the magnitude of exposure to a physical, chemical, or biological agent and the medical effects of exposure

A Exposure Points Assessed

Alternate Route of Exposure		Exposure Conditions			
		<CT	Occasionally >CT	>CT	>STD
AER Possible	NO	0	3	5	7
	YES	1-2	4	6	8

Notes: 1) AER = Alternate exposure route, such as skin absorption or ingestion 2) CT = DoD component threshold that triggers surveillance actions, such as action level 3) STD = DoD exposure limit, such as TLV or PEL 4) > = Greater than 5) < = Less than 6) ≤ = Less than or equal to

B Medical Effects Points Assessed

Condition	Points
No medical effects, such as nuisance noise and nuisance odor	0
Temporary reversible illness requiring supportive treatment, such as eye irritation and sore throat	1-2
Temporary reversible illness with a variable but limited period of disability, such as metal fume fever	3-4
Permanent, nonsevere illness or loss of capacity, such as permanent hearing loss	5-6
Permanent, severe, disabling, irreversible illness or death, such as asbestosis or lung cancer	7-8

C The HHSC is determined by totaling the points assessed and using the following guide

Total Points*	HHSC
13-16	I
9-12	II
5-8	III
0-4	IV

* Sum of A and B above

STEP 2: This step uses the following guidelines to assess points to determine the mishap probability category (MPC) for health hazards The probability of mishap reflects the duration of exposure and the number of exposed personnel

A Duration of Exposure Points Assessed

Type of Exposure	Length of Exposure		
	1-8 hr/wk	>8 hr/wk/not continuous	Continuous
Irregular/Intermittent	1-2	4-6	NA
Regular/Periodic	2-3	5-7	8

B Number of Exposed personnel Points Assessed

Number of Exposed Personnel	Points
<5	1-2
5-9	3-4
10-49	5-6
>49	7-8

C The MPC for health hazards is determined by totaling the points assessed and using the following guide:

Total Points*	MPC
14-16	A
10-13	B
5-9	C
<5	D

* Sum of A and B above

STEP 3: The RAC is determined using the following matrix:

HHSC	MPC			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5