



September 14, 2020

Diane Czarnecki  
Industrial Hygienist  
Facilities Management Division  
GSA Public Buildings Service – Heartland Region  
2300 Main Street  
Kansas City, MO 64108

Re: Goodfellow Federal Center  
Metals in Settled Dust Sampling – Resampling from June 2020 Event  
Project No. 121244

Dear Ms. Czarnecki:

Thank you for the opportunity to assist the General Services Administration (GSA) with the metals in settled dust sampling investigation at the Goodfellow Federal Center (GFC) in St. Louis, Missouri. Burns & McDonnell understands that the purpose of the investigation was to provide additional sampling data of existing environmental conditions that are present at GFC that could adversely impact the health and safety of building occupants as well as workers at the facility. The following report summarizes the sample collection activities and the laboratory analytical results of samples submitted.

## **INTRODUCTION**

Per historical use and previous characterization, Burns & McDonnell was contracted to perform settled dust sampling for the analysis of seven (7) of the Resource Conservation and Recovery Act (RCRA) target metals (arsenic, barium, cadmium, chromium, lead, selenium, and silver) from various surfaces throughout the complex that exceeded the lead clean area limit during the June 2020 sampling event. The purpose of this testing was to assess the effectiveness of cleaning and further characterize the presence and concentration of target metals in common tenant-occupied areas of the building.

The proposed sampling scheme, the number of samples, the sample distribution and general methodology was developed by GSA and Burns & McDonnell. Specific sample locations were determined during the June 2020 sampling event. Settled dust wipe sampling was conducted on September 4, 2020 by Emily Ahlemeyer of Burns & McDonnell.

## **METALS IN SETTLED DUST SAMPLING**

Metals in settled dust sampling was conducted primarily within tenant-occupied areas. Dust wipe sampling was conducted in accordance with ASTM Standard E1728: *Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination*. ASTM Standard E1728 is consistent with the methodology described in the Housing and Urban Development Guidelines and 40 CFR 745.63. The Brookhaven National Laboratory's Surface Wipe Sampling Procedure (IH75190) was also used as a guideline.



Diane Czarnecki  
Facilities Management Division  
September 14, 2020  
Page 2

Dust wipe sampling for the target metals was conducted on a variety of representative surfaces that have the potential of being disturbed by building occupants. A representative surface area of approximately one square foot (1 SF) was measured and delineated with plastic templates. The dust wipe samples were collected using dedicated dust wipe cloths meeting ASTM E1792 Standard. Each dust wipe cloth was pre-moistened and individually wrapped. Each sample was collected by wiping in a back and forth “S” pattern over a measured sampling area using a clean, disposable glove. Then, the wipe was folded over itself and the area was wiped again in a direction perpendicular to the first wipe orientation. Then, the wipe folded over itself again and the area was wiped around the perimeter. The wipe sample was then placed into a labeled, clean container. Dust wipe samples were submitted to Environmental Hazards Services, LLC (EHS) in Richmond, Virginia for Inductively Coupled Plasma (ICP) analysis of metals analysis using Environmental Protection Agency (EPA) method SW846 3050B/6010D. EHS is accredited under the American Industrial Hygiene Association (AIHA) Laboratory Accreditation Program (LAP) identification number LAP-100420.

Whereas the Occupational Safety and Health Administration (OSHA) has not established regulatory limits for surface concentrations of metals, the OSHA Technical Manual Section II: Chapter 2 (III.A) describes a method for calculating “housekeeping” standards, as recommended acceptable surface limits. Brookhaven’s IH75190 procedure uses the housekeeping standards to derive a lower, “clean area limit” for non-operational areas that can be accessed or contacted without special training or precautions. Burns & McDonnell calculated clean area limits for metals not included in the Brookhaven procedure, specifically barium, chromium (total), selenium and silver. Wipe results were compared to the Brookhaven procedure’s clean area limits for each metal.

Results of the dust wipe samples collected indicate that seven (7) of the eight (8) samples contained concentrations of target metals above laboratory reporting limits. The following table identifies the range of results for each of the seven metals that were analyzed. Samples with a “<” sign indicate that the results were below the lab’s reportable limit.

Diane Czarnecki  
 Facilities Management Division  
 September 14, 2020  
 Page 3

**Table 1. Summary of Dust Wipe Results**

Analyte	Lowest Concentration <sup>(a)</sup> (µg/sq. ft) <sup>(b)</sup>	Highest Concentration <sup>(a)</sup> (µg/sq. ft) <sup>(b)</sup>	Clean Area Limit <sup>(c)</sup> µg/sq. ft <sup>(b)</sup>
Silver	<2.0	<2.0	62
Arsenic	<2.0	<2.0	62
Barium	<2.0	32	3,094
Cadmium	<2.0	<2.0	31
Chromium (Total)	<2.0	34	3,094
Lead	<2.0	250	10 <sup>(d)</sup>
Selenium	<5.0	<5.0	1,236

- (a) Samples with a “<” sign indicate that the results were below the reportable limit.
- (b) µg/sq. ft = micrograms per square foot of surface area.
- (c) Clean Area Limit per Brookhaven IH75190=OSHA Housekeeping Limit [PEL (µg/m<sup>3</sup>) x 10 m<sup>3</sup>/100cm<sup>2</sup>] / 15.
- (d) Lead clean area limit: Brookhaven references EPA/HUD limit for floors, set at 10 µg/sq. ft. as of January 2020.

Five (5) samples exceeded the lead clean area limit. The remaining target metal sample results were below housekeeping and clean area limits, as recommended and described by OSHA and the Brookhaven Procedure.

Burns & McDonnell appreciates the opportunity to work with the GSA on this project. Please contact us if you have any questions regarding this report or if we may be of any additional service.

Sincerely,

(b) (6)

Matt Shanahan, CHMM  
 Project Manager

Attachments:  
 Appendix A – Sample Summary Table  
 Appendix B – Laboratory Analysis Report

**APPENDIX A – SAMPLE SUMMARY TABLE**

**Appendix A**  
**Sample Summary Table**

Goodfellow Federal Center - Wipe Sample Data							
Sample No.	Location	Area Description	Analyte	Results		Units	Clean Area Limit*
				Pre-Clean	Post-Clean		
103-W-01	1st Floor Secured Space	Elevator threshold, column B12	Silver	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Arsenic	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Barium	45	32	µg/ft <sup>2</sup>	3,094
			Cadmium	3.4	< 2.0	µg/ft <sup>2</sup>	31
			Chromium	7.2	2.7	µg/ft <sup>2</sup>	3,094
			Lead	56	20	µg/ft <sup>2</sup>	10
			Selenium	< 5.0	< 5.0	µg/ft <sup>2</sup>	1,236
103E-W-01	2nd Floor South Lobby	Floor tile near stairwell	Silver	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Arsenic	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Barium	22	7.1	µg/ft <sup>2</sup>	3,094
			Cadmium	< 2.0	< 2.0	µg/ft <sup>2</sup>	31
			Chromium	2.5	< 2.0	µg/ft <sup>2</sup>	3,094
			Lead	22	13	µg/ft <sup>2</sup>	10
			Selenium	< 5.0	< 5.0	µg/ft <sup>2</sup>	1,236
104-W-01	2nd Floor Freight Elevator	Elevator threshold near column B45	Silver	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Arsenic	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Barium	37	32	µg/ft <sup>2</sup>	3,094
			Cadmium	< 2.0	< 2.0	µg/ft <sup>2</sup>	31
			Chromium	7.5	34	µg/ft <sup>2</sup>	3,094
			Lead	42	250	µg/ft <sup>2</sup>	10
			Selenium	< 5.0	< 5.0	µg/ft <sup>2</sup>	1,236

**Appendix A**  
**Sample Summary Table**

Goodfellow Federal Center - Wipe Sample Data							
Sample No.	Location	Area Description	Analyte	Results		Units	Clean Area Limit*
				Pre-Clean	Post-Clean		
104-W-02	2nd Floor Freight Elevator	Threshold of elevator, column B17	Silver	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Arsenic	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Barium	11	28	µg/ft <sup>2</sup>	3,094
			Cadmium	< 2.0	< 2.0	µg/ft <sup>2</sup>	31
			Chromium	2.4	7.6	µg/ft <sup>2</sup>	3,094
			Lead	27	51	µg/ft <sup>2</sup>	10
			Selenium	< 5.0	< 5.0	µg/ft <sup>2</sup>	1,236
104E-W-01	2nd Floor Stairwell	Landing to penthouse floor	Silver	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Arsenic	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Barium	45	17	µg/ft <sup>2</sup>	3,094
			Cadmium	< 2.0	< 2.0	µg/ft <sup>2</sup>	31
			Chromium	< 2.0	< 2.0	µg/ft <sup>2</sup>	3,094
			Lead	41	3.1	µg/ft <sup>2</sup>	10
			Selenium	< 5.0	< 5.0	µg/ft <sup>2</sup>	1,236
104E-W-02	2nd Floor Canopy Café	Top of upper cabinets	Silver	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Arsenic	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Barium	24	17	µg/ft <sup>2</sup>	3,094
			Cadmium	< 2.0	< 2.0	µg/ft <sup>2</sup>	31
			Chromium	4.3	3.8	µg/ft <sup>2</sup>	3,094
			Lead	12	10	µg/ft <sup>2</sup>	10
			Selenium	< 5.0	< 5.0	µg/ft <sup>2</sup>	1,236

**Appendix A**  
**Sample Summary Table**

Goodfellow Federal Center - Wipe Sample Data							
Sample No.	Location	Area Description	Analyte	Results		Units	Clean Area Limit*
				Pre-Clean	Post-Clean		
105-W-01	1st Floor Freight Elevator	Threshold floor, column B16	Silver	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Arsenic	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Barium	35	25	µg/ft <sup>2</sup>	3,094
			Cadmium	< 2.0	< 2.0	µg/ft <sup>2</sup>	31
			Chromium	2.7	8.7	µg/ft <sup>2</sup>	3,094
			Lead	19	54	µg/ft <sup>2</sup>	10
			Selenium	< 5.0	< 5.0	µg/ft <sup>2</sup>	1,236
107-W-01	1st Floor Hallway	Floor outside of room 134	Silver	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Arsenic	< 2.0	< 2.0	µg/ft <sup>2</sup>	62
			Barium	19	< 2.0	µg/ft <sup>2</sup>	3,094
			Cadmium	< 2.0	< 2.0	µg/ft <sup>2</sup>	31
			Chromium	3.9	< 2.0	µg/ft <sup>2</sup>	3,094
			Lead	15	< 2.0	µg/ft <sup>2</sup>	10
			Selenium	< 5.0	< 5.0	µg/ft <sup>2</sup>	1,236

\* Clean Area Limit per Brookhaven IH75190=OSHA Housekeeping Limit [ $\mu\text{g}/\text{m}^3 \times 10 \text{ m}^3/100\text{cm}^2$ ] / 15. Lead clean area limit: Brookhaven references EPA/HUD limit for floors, set at 10 µg/sq. ft. as of January 2020.

Indicates results at or above the Clean Area Limit

**APPENDIX B – LABORATORY ANALYSIS REPORT**





Environmental Hazards Services, L.L.C.  
 7469 Whitepine Rd  
 Richmond, VA 23237  
 Telephone: 800.347.4010

## Wipe Metals Analysis Report

**Client:** Burns & McDonnell Engineering  
 9400 Ward Pkwy.  
 Kansas City, MO 64114

**Report Number:** 20-09-01085

**Received Date:** 09/08/2020

**Analyzed Date:** 09/10/2020

**Reported Date:** 09/11/2020

**Project/Test Address:** 168765; Goodfellow IH Services; 4300 Goodfellow Blvd.

**Client Number:**  
26-3514

# Laboratory Results

**Fax Number:**  
816-822-3494

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
20-09-01085-001	103-W-01	Arsenic (As)	1.00	<2.00	<2.0	
		Barium (Ba)	1.00	31.8	32	
		Cadmium (Cd)	1.00	<2.00	<2.0	
		Chromium (Cr)	1.00	2.70	2.7	
		Lead (Pb)	1.00	20.1	20	
		Selenium (Se)	1.00	<5.00	<5.0	
		Silver (Ag)	1.00	<2.00	<2.0	
20-09-01085-002	103E-W-01	Arsenic (As)	1.00	<2.00	<2.0	
		Barium (Ba)	1.00	7.10	7.1	
		Cadmium (Cd)	1.00	<2.00	<2.0	
		Chromium (Cr)	1.00	<2.00	<2.0	

# Environmental Hazards Services, L.L.C

**Client Number:** 26-3514

**Report Number:** 20-09-01085

**Project/Test Address:** 168765; Goodfellow IH Services; 4300 Goodfellow Blvd.

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Lead (Pb)	1.00	13.4	13	
		Selenium (Se)	1.00	<5.00	<5.0	
		Silver (Ag)	1.00	<2.00	<2.0	
20-09-01085-003	104-W-01	Arsenic (As)	1.00	<2.00	<2.0	
		Barium (Ba)	1.00	31.6	32	
		Cadmium (Cd)	1.00	<2.00	<2.0	
		Chromium (Cr)	1.00	33.8	34	
		Lead (Pb)	1.00	252	250	
		Selenium (Se)	1.00	<5.00	<5.0	
		Silver (Ag)	1.00	<2.00	<2.0	
20-09-01085-004	104-W-02	Arsenic (As)	1.00	<2.00	<2.0	
		Barium (Ba)	1.00	28.2	28	
		Cadmium (Cd)	1.00	<2.00	<2.0	
		Chromium (Cr)	1.00	7.58	7.6	
		Lead (Pb)	1.00	51.2	51	
		Selenium (Se)	1.00	<5.00	<5.0	
		Silver (Ag)	1.00	<2.00	<2.0	
20-09-01085-005	104E-W-01	Arsenic (As)	1.00	<2.00	<2.0	

# Environmental Hazards Services, L.L.C

**Client Number:** 26-3514

**Report Number:** 20-09-01085

**Project/Test Address:** 168765; Goodfellow IH Services; 4300 Goodfellow Blvd.

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Barium (Ba)	1.00	17.1	17	
		Cadmium (Cd)	1.00	<2.00	<2.0	
		Chromium (Cr)	1.00	<2.00	<2.0	
		Lead (Pb)	1.00	3.09	3.1	
		Selenium (Se)	1.00	<5.00	<5.0	
		Silver (Ag)	1.00	<2.00	<2.0	
20-09-01085-006	104E-W-02	Arsenic (As)	1.00	<2.00	<2.0	
		Barium (Ba)	1.00	16.7	17	
		Cadmium (Cd)	1.00	<2.00	<2.0	
		Chromium (Cr)	1.00	3.79	3.8	
		Lead (Pb)	1.00	10.1	10	
		Selenium (Se)	1.00	<5.00	<5.0	
		Silver (Ag)	1.00	<2.00	<2.0	
20-09-01085-007	105-W-01	Arsenic (As)	1.00	<2.00	<2.0	
		Barium (Ba)	1.00	25.0	25	
		Cadmium (Cd)	1.00	<2.00	<2.0	
		Chromium (Cr)	1.00	8.71	8.7	
		Lead (Pb)	1.00	54.0	54	

# Environmental Hazards Services, L.L.C

**Client Number:** 26-3514

**Report Number:** 20-09-01085

**Project/Test Address:** 168765; Goodfellow IH Services; 4300 Goodfellow Blvd.

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Selenium (Se)	1.00	<5.00	<5.0	
		Silver (Ag)	1.00	<2.00	<2.0	
20-09-01085-008	107-W-01	Arsenic (As)	1.00	<2.00	<2.0	
		Barium (Ba)	1.00	<2.00	<2.0	
		Cadmium (Cd)	1.00	<2.00	<2.0	
		Chromium (Cr)	1.00	<2.00	<2.0	
		Lead (Pb)	1.00	<2.00	<2.0	
		Selenium (Se)	1.00	<5.00	<5.0	
		Silver (Ag)	1.00	<2.00	<2.0	

# Environmental Hazards Services, L.L.C

**Client Number:** 26-3514

**Report Number:** 20-09-01085

**Project/Test Address:** 168765; Goodfellow IH Services; 4300 Goodfellow Blvd.

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
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Sample Narratives:

**Analyst:** Brittany Meyer

**Method:** Mercury (Hg): EPA SW846 7471B

All other metals: EPA SW846 3050B/6010D

(b) (6)

Reviewed By Authorized Signatory

*Tasha Eaddy*

QA/QC Clerk

Sample Results denoted with a "less than" (<) sign contains less than the reporting limit for each particular metal, based on a 100mL volume. The reporting limit for Mercury is 0.10ug, Aluminum, Iron and Zinc are 50ug, Antimony and Selenium are 5.0ug and 2.0ug for all other metals.

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Unless otherwise noted, samples are reported without a dry weight correction. Sample location, description, area, volume, etc., was provided by the client. If the report does not contain the result for a field blank, it is due to the fact that the client did not include a field blank with their samples. EHS sample results do not reflect blank correction. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C. California Certification #2319 NY ELAP #11714.

Legend                      ug = microgram                      ug/ft<sup>2</sup> = micrograms per square foot  
   mL = milliliter                      ft<sup>2</sup> = square foot

# ENVIRONMENTAL HAZARDS SERVICES, LLC

## Metals Chain of Custody Form

Company Name	Burns & McDonnell	Account #	26-3514
Company Address	9400 Ward Parkway	City/State/Zip	Kansas City, MO 64114
Phone	816-349-6646	Email	mshanahan@burnsmcd.com
Project Name / Testing Address	Goodfellow IH Services / 4300 Goodfellow Blvd.		
PO Number	168765	Collected By	Emily Ahlemeyer
Turn-Around Time	<input checked="" type="checkbox"/> 3 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 1 DAY <input type="checkbox"/> SAME DAY OR WEEKEND - Must Call Ahead		

LAB NUMBER	Client Sample ID	Collection Date & Time	METALS						Other Metals	PARTICULATES					AIR			WIPES  AREA Circle The Unit of Measurement Used cm or (in)	
			Pb TCLP	TCLP RCRA 8	RCRA 8 Total	Toxic Metal Profile	Welding Fume Profile	TX 11 TCLP		CA 17 Total	Total Nuisance Dust	Respirable Dust	TSP Gravimetric	TSP Pb	PM-10	Total Time Mins.	Flow Rate L/min.		Vol. Total Liters
1	103-W-01	9/4/2020 0805							Ag, As, Ba, Cd, Pb, Se, Cr										12 x 12
2	103E-W-01	0910																	12 x 12
3	104-W-01	0920																	12 x 12
4	104-W-02	0925																	12 x 12
5	104E-W-01	1010																	12 x 12
6	104E-W-02	1005																	12 x 12
7	105-W-01	0940																	12 x 12
8	107-W-01	0840																	12 x 12
9																			x
10																			x
11																			x
12																			x
13																			x
14																			x
15																			x

Released By: <u>Emily Ahlemeyer</u>	Date: <u>9/4/2020</u>	Time: <u>1345</u>
Signature: <u>(b) (6)</u>		

LAB USE ONLY - BELOW THIS LINE

Received By: T. Lohman

Signature: (b) (6)


Date: 9/8/20 Time: 2:49  AM  PM

Portal Contact Added

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010

RESULTS VIA CLIENT PORTAL AVAILABLE @ [www.leadlab.com](http://www.leadlab.com)

20-09-01085



Due Date:  
**09/11/2020**  
(Friday)  
EL