



January 12, 2022

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 – Building 104F
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 of Building 104F located 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 within buildings. The purpose of this testing was to 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 by sampling personnel while on-site.

Settled dust wipe sampling at Bldg. 104F was conducted on December 1, 2021 by Ashley Anstaett and Emily Pulcher 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* and ASTM Standard D6966: *Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Determination of Metals*. ASTM Standards E1728 and D6966 are consistent with the methodology described in the Housing and

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Urban Development Guidelines-Appendix 13.1 and 40 CFR 745.63. The Brookhaven National Laboratory's Surface Wipe Sampling Procedure (IH75190) was also used as a guideline.

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 from the building indicate that 8 of the 9 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.

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Table 1. Summary of Dust Wipe Results

Analyte	Lowest Concentration ^(a) (µg/sq. ft) ^(b)	Highest Concentration ^(a) (µg/sq. ft) ^(b)	Clean Area Limit ^(c) µg/sq. ft ^(b)
Silver	<0.4	<0.5	62
Arsenic	<2.5	<2.5	62
Barium	0.9	4.0	3,094
Cadmium	<0.1	0.2	31
Chromium (Total)	<0.7	1.1	3,094
Lead	<0.4	6.7	10 ^(d)
Selenium	<1.8	<2.5	1,236

- (a) Samples with a “<” sign indicate that the results were below the laboratory’s reporting limit.
- (b) µg/sq. ft = micrograms per square foot of surface area.
- (c) Clean Area Limit per Brookhaven IH75190=OSHA Housekeeping Limit $[[PEL (\mu\text{g}/\text{m}^3) \times 10 \text{ m}^3/100\text{cm}^2] \times 929\text{cm}^2/\text{sq. ft.}] / 15$.
- (d) Lead clean area limit: Brookhaven references EPA/HUD limit for floors, set at 10 µg/sq. ft. as of January 2020.

Of the 8 samples that had detectable levels of one or more analytes, none of them exceeded the clean area limit.

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

Information in Appendices A and B is not accessible for people using screen reader technology. If this information is required, it can be furnished upon request by contacting 816-223-6198 or r6environmental@gsa.gov.

APPENDIX A – SAMPLE SUMMARY TABLE

Appendix A

Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
104F-W-01	2nd floor, south lobby	Floor in front of elevator	Arsenic	< 2.5	µg/ft ²	62
			Barium	3.9	µg/ft ²	3,094
			Cadmium	< 0.10	µg/ft ²	31
			Chromium	< 1.0	µg/ft ²	3,094
			Lead	2.3	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
			Silver	< 0.50	µg/ft ²	62
104F-W-02	2nd floor, Oaks conference room	Main table	Arsenic	< 2.5	µg/ft ²	62
			Barium	1.1	µg/ft ²	3,094
			Cadmium	< 0.10	µg/ft ²	31
			Chromium	< 1.0	µg/ft ²	3,094
			Lead	< 0.50	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
			Silver	< 0.50	µg/ft ²	62
104F-W-03	2nd floor, Oaks conference room	Top of printer	Arsenic	< 2.5	µg/ft ²	62
			Barium	2.7	µg/ft ²	3,094
			Cadmium	< 0.072	µg/ft ²	31
			Chromium	< 0.72	µg/ft ²	3,094
			Lead	0.41	µg/ft ²	10
			Selenium	< 1.8	µg/ft ²	1,236
			Silver	< 0.36	µg/ft ²	62
104F-W-04	2nd floor, Oaks conference room	Chair at northeast end of table	Arsenic	< 2.5	µg/ft ²	62
			Barium	0.92	µg/ft ²	3,094
			Cadmium	0.24	µg/ft ²	31
			Chromium	< 1.0	µg/ft ²	3,094
			Lead	1.6	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
			Silver	< 0.50	µg/ft ²	62

Appendix A

Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
104F-W-05	2nd floor, northeast storage room	Floor inside door	Arsenic	< 2.5	µg/ft ²	62
			Barium	2.4	µg/ft ²	3,094
			Cadmium	0.14	µg/ft ²	31
			Chromium	< 1.0	µg/ft ²	3,094
			Lead	0.90	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
			Silver	< 0.50	µg/ft ²	62
104F-W-06	2nd floor, northeast storage room	Top of filing cabinet on south wall	Arsenic	< 2.5	µg/ft ²	62
			Barium	2.8	µg/ft ²	3,094
			Cadmium	< 0.10	µg/ft ²	31
			Chromium	< 1.0	µg/ft ²	3,094
			Lead	0.72	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
			Silver	< 0.50	µg/ft ²	62
104F-W-07	1st floor, north lobby	Floor at base of stairs	Arsenic	< 2.5	µg/ft ²	62
			Barium	2.1	µg/ft ²	3,094
			Cadmium	< 0.10	µg/ft ²	31
			Chromium	< 1.0	µg/ft ²	3,094
			Lead	1.2	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
			Silver	< 0.50	µg/ft ²	62
104F-W-08	2nd floor, south stairwell	Hand rail to second floor	Arsenic	< 2.5	µg/ft ²	62
			Barium	4.0	µg/ft ²	3,094
			Cadmium	< 0.10	µg/ft ²	31
			Chromium	1.1	µg/ft ²	3,094
			Lead	6.7	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
			Silver	< 0.50	µg/ft ²	62

Appendix A
Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
104F-W-09	Field blank	--	Arsenic	< 2.50	µg	--
			Barium	< 0.500	µg	--
			Cadmium	< 0.100	µg	--
			Chromium	< 1.00	µg	--
			Lead	< 0.500	µg	--
			Selenium	< 2.50	µg	--
			Silver	< 0.500	µg	--

* Clean Area Limit per Brookhaven IH75190=OSHA Housekeeping Limit $[[PEL (\mu\text{g}/\text{m}^3) \times 10 \text{ m}^3/100\text{cm}^2] \times 929\text{cm}^2/\text{sq. ft.}] / 15$. Lead clean area limit: Brookhaven references EPA/HUD limit for floors, set at 10 µg/sq. ft. as of January 2020.

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: 21-12-00460

Received Date: 12/03/2021

Analyzed Date: 12/04/2021

Reported Date: 12/08/2021

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd

Client Number:
 26-3514

Laboratory Results

Fax Number:
 816-822-3494

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft ²)	Total Metal (ug)	Concentration (ug/ft ²)	Narrative ID
21-12-00460-001	104F-W-01	Arsenic (As)	1.00	<2.50	<2.5	
		Barium (Ba)	1.00	3.92	3.9	
		Cadmium (Cd)	1.00	<0.100	<0.10	
		Chromium (Cr)	1.00	<1.00	<1.0	
		Lead (Pb)	1.00	2.34	2.3	
		Selenium (Se)	1.00	<2.50	<2.5	
		Silver (Ag)	1.00	<0.500	<0.50	
21-12-00460-002	104F-W-02	Arsenic (As)	1.00	<2.50	<2.5	
		Barium (Ba)	1.00	1.06	1.1	
		Cadmium (Cd)	1.00	<0.100	<0.10	
		Chromium (Cr)	1.00	<1.00	<1.0	

Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 21-12-00460

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft ²)	Total Metal (ug)	Concentration (ug/ft ²)	Narrative ID
		Lead (Pb)	1.00	<0.500	<0.50	
		Selenium (Se)	1.00	<2.50	<2.5	
		Silver (Ag)	1.00	<0.500	<0.50	
21-12-00460-003	104F-W-03	Arsenic (As)	1.39	<2.50	<2.5	
		Barium (Ba)	1.39	3.76	2.7	
		Cadmium (Cd)	1.39	<0.100	<0.072	
		Chromium (Cr)	1.39	<1.00	<0.72	
		Lead (Pb)	1.39	0.565	0.41	
		Selenium (Se)	1.39	<2.50	<1.8	
		Silver (Ag)	1.39	<0.500	<0.36	
21-12-00460-004	104F-W-04	Arsenic (As)	1.00	<2.50	<2.5	
		Barium (Ba)	1.00	0.915	0.92	
		Cadmium (Cd)	1.00	0.245	0.24	
		Chromium (Cr)	1.00	<1.00	<1.0	
		Lead (Pb)	1.00	1.59	1.6	
		Selenium (Se)	1.00	<2.50	<2.5	
		Silver (Ag)	1.00	<0.500	<0.50	
21-12-00460-005	104F-W-05	Arsenic (As)	1.00	<2.50	<2.5	
		Barium (Ba)	1.00	2.38	2.4	

Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 21-12-00460

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft ²)	Total Metal (ug)	Concentration (ug/ft ²)	Narrative ID
		Cadmium (Cd)	1.00	0.135	0.14	
		Chromium (Cr)	1.00	<1.00	<1.0	
		Lead (Pb)	1.00	0.900	0.90	
		Selenium (Se)	1.00	<2.50	<2.5	
		Silver (Ag)	1.00	<0.500	<0.50	
21-12-00460-006	104F-W-06	Arsenic (As)	1.00	<2.50	<2.5	
		Barium (Ba)	1.00	2.80	2.8	
		Cadmium (Cd)	1.00	<0.100	<0.10	
		Chromium (Cr)	1.00	<1.00	<1.0	
		Lead (Pb)	1.00	0.715	0.72	
		Selenium (Se)	1.00	<2.50	<2.5	
		Silver (Ag)	1.00	<0.500	<0.50	
21-12-00460-007	104F-W-07	Arsenic (As)	1.00	<2.50	<2.5	
		Barium (Ba)	1.00	2.08	2.1	
		Cadmium (Cd)	1.00	<0.100	<0.10	
		Chromium (Cr)	1.00	<1.00	<1.0	
		Lead (Pb)	1.00	1.15	1.2	
		Selenium (Se)	1.00	<2.50	<2.5	
		Silver (Ag)	1.00	<0.500	<0.50	

Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 21-12-00460

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft ²)	Total Metal (ug)	Concentration (ug/ft ²)	Narrative ID
21-12-00460-008	104F-W-08	Arsenic (As)	1.00	<2.50	<2.5	
		Barium (Ba)	1.00	4.00	4.0	
		Cadmium (Cd)	1.00	<0.100	<0.10	
		Chromium (Cr)	1.00	1.08	1.1	
		Lead (Pb)	1.00	6.73	6.7	
		Selenium (Se)	1.00	<2.50	<2.5	
		Silver (Ag)	1.00	<0.500	<0.50	
21-12-00460-009	104F-W-09	Arsenic (As)		<2.50	<2.5	
		Barium (Ba)		<0.500	<0.50	
		Cadmium (Cd)		<0.100	<0.10	
		Chromium (Cr)		<1.00	<1.0	
		Lead (Pb)		<0.500	<0.50	
		Selenium (Se)		<2.50	<2.5	
		Silver (Ag)		<0.500	<0.50	

Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 21-12-00460

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd

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

Analyst: Kailee Guthrie

Method: Mercury (Hg): EPA SW846 7471B

All other metals: EPA SW846 3050B/6010D

(b) (6)

Reviewed By Authorized Signatory:

Melissa Kanode

QA/QC Clerk

Sample Results denoted with a "less than" (<) sign contains less than the reporting limit for each particular metal, based on a 50mL volume. The reporting limit for Cadmium is 0.10ug, Barium, Lead and Silver are 0.50ug, Arsenic and Chromium are 1.0ug, and Selenium is 2.5ug.

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. These sample results do not reflect blank correction. This report shall not be reproduced except in full, without the written consent of Environmental Hazards Services, L.L.C. NY ELAP #11714.

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

ENVIRONMENTAL HAZARDS SERVICES, LLC

Metals Chain of Custody Form

Pg 1 of 1

Company Name	Burns & McDonnell	Account #	26-3514
Company Address	9400 Ward Parkway	City/State/Zip	Kansas City, MO 64114
Phone	314-302-4661	Email	eapulcher@burnsmcd.com
Project Name / Testing Address		GFC / 4300 Goodfellow Blvd	
PO Number	168765	Collected By	Ashley Anstaett & Emily Pulcher
Turn-Around Time	<input checked="" type="radio"/> 5 DAY <input type="radio"/> 3 DAY <input type="radio"/> 2 DAY <input type="radio"/> 1 DAY <input type="radio"/> SAME DAY OR WEEKEND - Must Call Ahead		

LAB NUMBER	Client Sample ID	Collection Date & Time	METALS							Other Metals	PARTICULATES					AIR			WIPES
			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	Flow Rate	Vol.	AREA Circle The Unit of Measurement Used cm or (in)
																Mins.	L/min.	Total Liters	
1	104F-W-01	12/1/21 0918							Ag, As, Ba, Cd, Cr, Pb, Se										12 x 12
2	104F-W-02	0920																	12 x 12
3	104F-W-03	0922																	10 x 20
4	104F-W-04	0923																	12 x 12
5	104F-W-05	0931																	12 x 12
6	104F-W-06	0933																	12 x 12
7	104F-W-07	0937																	12 x 12
8	104F-W-08	0942																	6 x 24
9	104F-W-09	0941																	NA x NA
10																			x
11																			x
12																			x
13																			x
14																			x
15																			x

Released By: Emily Pulcher	Date: 12/2/21	Time: 1600
Signature: (b) (6)		

LAB USE ONLY – BELOW THIS LINE

Received By: TS Stone


Signature: (b) (6)

Date: 12, 3, 21 Time: 1:00 AM PM

Portal Contact Added

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010
 RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

21-12-00460



Due Date:
12/10/2021
(Friday)
EL MM-L