July 13, 2021

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 104E
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 104E 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. 104E was conducted on June 16, 2021 by Ashley Anstaett and Eric Wenger 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

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 9 of the 12 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.

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	<0.5	4.7	62
Arsenic	<2.5	3.1	62
Barium	<0.5	41.0	3,094
Cadmium	<0.1	0.2	31
Chromium (Total)	<1.0	4.1	3,094
Lead	<0.5	8.8	10 [d]
Selenium	<2.5	<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 (µg/m^3) x 10 m^3/100cm^2] / 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 9 samples that had detectable levels of one or more analytes, 0 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*
104E-W-01	1st floor, north entrance	Floor sample	Arsenic	< 2.5	µg/ft^2	62
			Barium	41	µg/ft^2	3,094
			Cadmium	0.12	µg/ft^2	31
			Chromium	1.5	µg/ft^2	3,094
			Lead	8.8	µg/ft^2	10
			Selenium	< 2.5	µg/ft^2	1,236
			Silver	< 0.50	µg/ft^2	62
104E-W-02	1st floor, north IT room	Table with ceiling tile debris	Arsenic	< 2.5	µg/ft^2	62
			Barium	39	µg/ft^2	3,094
			Cadmium	0.12	µg/ft^2	31
			Chromium	1.6	µg/ft^2	3,094
			Lead	1.0	µg/ft^2	10
			Selenium	< 2.5	µg/ft^2	1,236
			Silver	4.7	µg/ft^2	62
104E-W-03	1st floor, north IT room	Floor sample, middle aisle	Arsenic	3.1	µg/ft^2	62
			Barium	8.2	µg/ft^2	3,094
			Cadmium	< 0.10	µg/ft^2	31
			Chromium	< 1.0	µg/ft^2	3,094
			Lead	1.8	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*
104E-W-04	1st floor	Janitor's closet near men's restroom	Arsenic	< 2.5	µg/ft^2	62
			Barium	3.2	µg/ft^2	3,094
			Cadmium	< 0.10	µg/ft^2	31
			Chromium	1.3	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
104E-W-05	1st floor, break room	Top of refrigerator near sink	Arsenic	< 2.5	µg/ft^2	62
			Barium	1.0	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
104E-W-06	1st floor, south electrical closet	Floor sample	Arsenic	< 2.5	µg/ft^2	62
			Barium	10	µg/ft^2	3,094
			Cadmium	0.18	µg/ft^2	31
			Chromium	3.2	µg/ft^2	3,094
			Lead	8.1	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*
104E-W-07	2nd floor, north stairwell	Floor outside door	Arsenic	< 2.5	µg/ft^2	62
			Barium	13	µg/ft^2	3,094
			Cadmium	< 0.10	µg/ft^2	31
			Chromium	< 1.0	µg/ft^2	3,094
			Lead	2.8	µg/ft^2	10
			Selenium	< 2.5	µg/ft^2	1,236
			Silver	< 0.50	µg/ft^2	62
104E-W-08	2nd floor, north stairwell	Hand rail	Arsenic	< 2.5	µg/ft^2	62
			Barium	8.7	µg/ft^2	3,094
			Cadmium	0.18	µg/ft^2	31
			Chromium	4.1	µg/ft^2	3,094
			Lead	5.3	µg/ft^2	10
			Selenium	< 2.5	µg/ft^2	1,236
			Silver	1.5	µg/ft^2	62
104E-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	--

Appendix A
Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
104E-W-10	2nd floor, waiting area	Window sill	Arsenic	< 2.5	µg/ft^2	62
			Barium	< 0.50	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
104E-W-11	2nd floor, north stairwell	Floor outside door	Arsenic	< 2.5	µg/ft^2	62
			Barium	1.0	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
104E-W-12	2nd floor, office area	Desk surface, M471A	Arsenic	< 2.5	µg/ft^2	62
			Barium	< 0.50	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

* Clean Area Limit per Brookhaven IH75190=OSHA Housekeeping Limit [PEL (µg/m^3) x 10 m^3/100cm^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

Note:

Surface wipe area for samples 104E-W-10, 104E-W-11, and 104E-W-12 was not marked on chain of custody, but field notes indicate sample area was 1 square foot for each.

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: 21-06-04568

Received Date: 06/29/2021
Analyzed Date: 07/06/2021
Reported Date: 07/07/2021

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; St. Louis, MO #121244

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
21-06-04568-001	104E-W-01	Arsenic (As)	1.00	<2.50	<2.5	L01
		Barium (Ba)	1.00	40.7	41	L01
		Cadmium (Cd)	1.00	0.125	0.12	L01
		Chromium (Cr)	1.00	1.46	1.5	L01
		Lead (Pb)	1.00	8.76	8.8	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
21-06-04568-002	104E-W-02	Arsenic (As)	1.00	<2.50	<2.5	L01
		Barium (Ba)	1.00	39.2	39	L01
		Cadmium (Cd)	1.00	0.120	0.12	L01
		Chromium (Cr)	1.00	1.60	1.6	L01

Client Number: 26-3514 **Report Number:** 21-06-04568

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; St. Louis, MO #121244

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft^2)	Total Metal (ug)	Concentration (ug/ft^2)	Narrative ID
		Lead (Pb)	1.00	1.03	1.0	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	4.68	4.7	L01
21-06-04568-003	104E-W-03	Arsenic (As)	1.00	3.08	3.1	L01
		Barium (Ba)	1.00	8.15	8.2	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	1.78	1.8	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
21-06-04568-004	104E-W-04	Arsenic (As)	1.00	<2.50	<2.5	L01
		Barium (Ba)	1.00	3.21	3.2	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	1.34	1.3	L01
		Lead (Pb)	1.00	2.33	2.3	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
21-06-04568-005	104E-W-05	Arsenic (As)	1.00	<2.50	<2.5	L01

Client Number: 26-3514 **Report Number:** 21-06-04568

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; St. Louis, MO #121244

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft^2)	Total Metal (ug)	Concentration (ug/ft^2)	Narrative ID
		Barium (Ba)	1.00	0.995	1.0	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	<0.500	<0.50	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
21-06-04568-006	104E-W-06	Arsenic (As)	1.00	<2.50	<2.5	L01
		Barium (Ba)	1.00	10.3	10	L01
		Cadmium (Cd)	1.00	0.175	0.18	L01
		Chromium (Cr)	1.00	3.16	3.2	L01
		Lead (Pb)	1.00	8.06	8.1	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
21-06-04568-007	104E-W-07	Arsenic (As)	1.00	<2.50	<2.5	L01
		Barium (Ba)	1.00	12.8	13	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	2.76	2.8	L01

Client Number: 26-3514 **Report Number:** 21-06-04568

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; St. Louis, MO #121244

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft^2)	Total Metal (ug)	Concentration (ug/ft^2)	Narrative ID
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
21-06-04568-008	104E-W-08	Arsenic (As)	1.00	<2.50	<2.5	L01
		Barium (Ba)	1.00	8.70	8.7	L01
		Cadmium (Cd)	1.00	0.185	0.18	L01
		Chromium (Cr)	1.00	4.06	4.1	L01
		Lead (Pb)	1.00	5.28	5.3	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	1.54	1.5	L01
21-06-04568-009	104E-W-09	Arsenic (As)		<2.50	---	L01
		Barium (Ba)		<0.500	---	L01
		Cadmium (Cd)		<0.100	---	L01
		Chromium (Cr)		<1.00	---	L01
		Lead (Pb)		<0.500	---	L01
		Selenium (Se)		<2.50	---	L01
		Silver (Ag)		<0.500	---	L01
21-06-04568-010	104E-W-10	Arsenic (As)		<2.50	---	L01
		Barium (Ba)		<0.500	---	L01

Client Number: 26-3514 **Report Number:** 21-06-04568

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; St. Louis, MO #121244

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft^2)	Total Metal (ug)	Concentration (ug/ft^2)	Narrative ID
		Cadmium (Cd)		<0.100	---	L01
		Chromium (Cr)		<1.00	---	L01
		Lead (Pb)		<0.500	---	L01
		Selenium (Se)		<2.50	---	L01
		Silver (Ag)		<0.500	---	L01
21-06-04568-011	104E-W-11	Arsenic (As)		<2.50	---	L01
		Barium (Ba)		1.02	---	L01
		Cadmium (Cd)		<0.100	---	L01
		Chromium (Cr)		<1.00	---	L01
		Lead (Pb)		<0.500	---	L01
		Selenium (Se)		<2.50	---	L01
		Silver (Ag)		<0.500	---	L01
21-06-04568-012	104E-W-12	Arsenic (As)		<2.50	---	L01
		Barium (Ba)		<0.500	---	L01
		Cadmium (Cd)		<0.100	---	L01
		Chromium (Cr)		<1.00	---	L01
		Lead (Pb)		<0.500	---	L01
		Selenium (Se)		<2.50	---	L01

Environmental Hazards Services, L.L.C

Client Number: 26-3514 **Report Number:** 21-06-04568

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; St. Louis, MO #121244

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft^2)	Total Metal (ug)	Concentration (ug/ft^2)	Narrative ID
		Silver (Ag)		<0.500	---	L01

Sample Narratives:

L01: The reporting limit for arsenic for all samples is 2.5 ug.

Analyst: Kailee Guthrie

Method: Mercury (Hg): EPA SW846 7471B

All other metals: EPA SW846 3050B/6010D

Reviewed By Authorized Signatory: (b) (6) [redacted]

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 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. 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^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	eaahlemeyer@burnsmcd.com
Project Name / Testing Address	GFC / 4300 Goodfellow Blvd, St. Louis, MO #121244		
PO Number	168765	Collected By	Eric Wenger & Ashley Anstaett
Turn-Around Time	[X] 3 DAY ( ) 2 DAY ( ) 1 DAY ( ) SAME DAY OR WEEKEND - Must Call Ahead		

LAB NUMBER	Client Sample ID	Collection Date & Time	METALS: Pb TCLP	TCLP RCRA 8	RCRA 8 Total	Toxic Metal Profile	Welding Fume Profile	TX 11 TCLP	CA 17 Total	Other Metals	PARTICULATES: Total Nuisance Dust	Respirable Dust	TSP Gravimetric	TSP Pb	PM-10	AIR: Total Time (Mins.)	Flow Rate (L/min.)	Vol. (Total Liters)	WIPES: AREA (Circle The Unit of Measurement Used: cm or in)
1	104E-W-01	6/16/21 0853								Ag, As, Ba, Cd, Cr, Pb, Se									12 x 12
2	104E-W-02	0857																	12 x 12
3	104E-W-03	0859																	12 x 12
4	104E-W-04	0905																	12 x 12
5	104E-W-05	0907																	12 x 12
6	104E-W-06	0913																	12 x 12
7	104E-W-07	0918																	12 x 12
8	104E-W-08	0923																	6 x 24
9	104E-W-09	0725																	NA x NA
10	104E-W-10																		x
11	104E-W-11																		x
12	104E-W-12																		x
13																			x
14																			x
15																			x

Released By:	Ashley Anstaett	Date:	6/25/21	Time:	1600
Signature:	(b) (6) [redacted]				

LAB USE ONLY – BELOW THIS LINE

Received By: TStone

Signature: (b) (6) [redacted]

Date: 6/29/21 Time: 12:20 [ ] AM [X] PM

[ ] Portal Contact Added

21-06-04568

Due Date: 07/02/2021 (Friday)

EL MM-L

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

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com