January 9, 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 – Bldg. 104 Air Sampling
Project No. 121244

Dear Ms. Czarnecki:

Thank you for the opportunity to provide the General Services Administration (GSA) with the Resource Conservation and Recovery Act (RCRA) metals air sampling investigation of the above referenced building located at the Goodfellow Federal Complex, in St. Louis, Missouri. Burns & McDonnell understands that the purpose of the investigation was to provide sampling data regarding existing conditions to supplement previous investigation reports prepared for the facility. The following report summarizes air-sample collection activities and the laboratory analytical results of the samples submitted.

METHODOLOGY

On December 6 and 7, 2022, Abiodun Akinola & Jeff Smith of Burns & McDonnell and OCCU-TEC conducted area air-sampling for the presence of seven (7) of the RCRA metals including arsenic, barium, cadmium, chromium, lead, selenium, and silver. Sampling was conducted in various locations throughout Building 104.

The sampling plan, number of samples, sample distribution, and general methodology was developed based on previous investigation methodology and in coordination with the GSA. Sample locations and samples collected from discretionary locations were determined by sampling personnel while on-site.

Air samples for RCRA metals were collected on 37-millimeter (mm) cassettes with 0.8 micrometer (µm) mixed cellulose ester (MCE) filters, using powered air sampling pumps, in accordance with the National Institute for Occupational Safety and Health (NIOSH) Method 7300. The sampling strategy included collecting a minimum sample volume of 500 liters based on the calibrated pump flow rate and sample duration. Air samples were submitted under chain-of-custody to Environmental Hazards Services, LLC (EHS) in Richmond, Virginia for independent analysis of 7 RCRA metals according to NIOSH method 7300. EHS is accredited under the American Industrial Hygiene Association (AIHA) Industrial Hygiene Laboratory Accreditation Program (IHLAP) program, identification number LAP-100420.

RESULTS AND DISCUSSION

Results of the air sampling are summarized in the table below by identifying the range of results for Building 104 for each of the seven (7) metals that were sampled. Results indicate that all 11 air samples collected from Building 104 and analyzed for RCRA metals were below their respective OSHA Permissible Exposure Limit (PEL), as based on a time-weighted-average. Although total air volume for two samples (104-A-09 and 104-A-10) were slightly less than 500 L minimum volume target, it did not adversely affect reporting limit concentrations, which were all significantly below exposure limits.

Table 1. Summary of Air Sampling Results

Analyte	Lowest Concentration[(a)] (µg/m^3) [(b)]	Highest Concentration[(a)] (µg/m^3) [(b)]	Permissible Exposure Limit (PEL) (µg/m^3) [(b)]
Arsenic	<0.22	<0.34	10
Barium	<0.22	<0.34	500
Cadmium	<0.044	<0.067	5
Chromium (Total)	<1.1	<1.7	500
Lead	<0.22	<0.34	1
Selenium	<1.1	<1.7	200
Silver	<0.22	<0.34	10

Notes:

(a) Samples with a "<" sign indicate that the results were below the laboratory's reporting limit, which varies based on sample air volume.

(b) µg/m^3 = micrograms per cubic meter of air.

GSA may choose to compare results with guidance limits from additional organizations for risk evaluation, including but not limited to the American Conference of Governmental Industrial Hygienists (ACGIH) and/or the World Health Organization (WHO).

A summary table of all sampling results by location is included in Appendix A. The complete laboratory report for the air sampling from EHS is attached in Appendix B.

LIMITATIONS

The scope of this assessment was limited as follows. Burns & McDonnell collected samples from a select number of locations in an effort to minimize cost while providing a general overview of the air quality at the site. Sample locations do not encompass every indoor space at

the site. Additionally, based on previous sampling history, samples were only analyzed for a select number of potential contaminants likely to affect the air quality at the site. Burns & McDonnell is not responsible for potential contaminants not identified in this report. This report was prepared for the sole use of GSA.

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 – Results Summary by Location
Appendix B – Air Sample Laboratory 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 – RESULTS SUMMARY BY LOCATION

Appendix A
Results Summary by Location

Sample Number	Location	Analyte	Result	Units	Recommended Limits[1]
104-A-01	2nd floor, data center, top of air conditioning unit at column B13	Arsenic	< 0.27	µg/m^3	10
		Barium	< 0.27	µg/m^3	500
		Cadmium	< 0.054	µg/m^3	5
		Chromium	< 1.4	µg/m^3	500
		Lead[2]	< 0.27	µg/m^3	1
		Selenium	< 1.4	µg/m^3	200
		Silver	< 0.27	µg/m^3	10
104-A-02	2nd floor, data center, small table across from column F16	Arsenic	< 0.27	µg/m^3	10
		Barium	< 0.27	µg/m^3	500
		Cadmium	< 0.054	µg/m^3	5
		Chromium	< 1.4	µg/m^3	500
		Lead[2]	< 0.27	µg/m^3	1
		Selenium	< 1.4	µg/m^3	200
		Silver	< 0.27	µg/m^3	10
104-A-03	2nd floor, column J10	Arsenic	< 0.22	µg/m^3	10
		Barium	< 0.22	µg/m^3	500
		Cadmium	< 0.044	µg/m^3	5
		Chromium	< 1.1	µg/m^3	500
		Lead[2]	< 0.22	µg/m^3	1
		Selenium	< 1.1	µg/m^3	200
		Silver	< 0.22	µg/m^3	10
104-A-04	2nd floor, break room at column B20	Arsenic	< 0.22	µg/m^3	10
		Barium	< 0.22	µg/m^3	500
		Cadmium	< 0.044	µg/m^3	5
		Chromium	< 1.1	µg/m^3	500
		Lead[2]	< 0.22	µg/m^3	1
		Selenium	< 1.1	µg/m^3	200
		Silver	< 0.22	µg/m^3	10
104-A-05	2nd floor, break room at column J34	Arsenic	< 0.23	µg/m^3	10
		Barium	< 0.23	µg/m^3	500
		Cadmium	< 0.046	µg/m^3	5
		Chromium	< 1.2	µg/m^3	500
		Lead[2]	< 0.23	µg/m^3	1
		Selenium	< 1.2	µg/m^3	200
		Silver	< 0.23	µg/m^3	10

Appendix A
Results Summary by Location

Sample Number	Location	Analyte	Result	Units	Recommended Limits[1]
104-A-06	2nd floor, data center, room 3, top of boxes at column F7	Arsenic	< 0.29	µg/m^3	10
		Barium	< 0.29	µg/m^3	500
		Cadmium	< 0.058	µg/m^3	5
		Chromium	< 1.5	µg/m^3	500
		Lead[2]	< 0.29	µg/m^3	1
		Selenium	< 1.5	µg/m^3	200
		Silver	< 0.29	µg/m^3	10
104-A-07	2nd floor, data center, room 2, top of table at column D3	Arsenic	< 0.30	µg/m^3	10
		Barium	< 0.30	µg/m^3	500
		Cadmium	< 0.059	µg/m^3	5
		Chromium	< 1.5	µg/m^3	500
		Lead[2]	< 0.30	µg/m^3	1
		Selenium	< 1.5	µg/m^3	200
		Silver	< 0.30	µg/m^3	10
104-A-08	2nd floor, data center, column F11	Arsenic	< 0.28	µg/m^3	10
		Barium	< 0.28	µg/m^3	500
		Cadmium	< 0.055	µg/m^3	5
		Chromium	< 1.4	µg/m^3	500
		Lead[2]	< 0.28	µg/m^3	1
		Selenium	< 1.4	µg/m^3	200
		Silver	< 0.28	µg/m^3	10
104-A-09	2nd floor, office at column E24	Arsenic	< 0.34	µg/m^3	10
		Barium	< 0.34	µg/m^3	500
		Cadmium	< 0.067	µg/m^3	5
		Chromium	< 1.7	µg/m^3	500
		Lead[2]	< 0.34	µg/m^3	1
		Selenium	< 1.7	µg/m^3	200
		Silver	< 0.34	µg/m^3	10
104-A-10	2nd floor, north elevator lobby	Arsenic	< 0.34	µg/m^3	10
		Barium	< 0.34	µg/m^3	500
		Cadmium	< 0.067	µg/m^3	5
		Chromium	< 1.7	µg/m^3	500
		Lead[2]	< 0.34	µg/m^3	1
		Selenium	< 1.7	µg/m^3	200
		Silver	< 0.34	µg/m^3	10

Appendix A
Results Summary by Location

Sample Number	Location	Analyte	Result	Units	Recommended Limits[1]
104-A-11	Field blank	Arsenic	< 0.15	µg	--
		Barium	< 0.15	µg	--
		Cadmium	< 0.030	µg	--
		Chromium	< 0.75	µg	--
		Lead[2]	< 0.15	µg	--
		Selenium	< 0.75	µg	--
		Silver	< 0.15	µg	--

Notes:

[1]Limits equal to the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs)

[2]Limits equal to the World Health organization (WHO) Ambient Air Limit

APPENDIX B – AIR SAMPLE LABORATORY REPORT

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

Air Metals Analysis Report

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

Report Number: 22-12-01579
Received Date: 12/12/2022
Reported Date: 12/19/2022

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

Client Number: 26-3514

Fax Number: 816-822-3494

Laboratory Results

Lab Sample Number	Client Sample Number	Analyzed Date	Analyte	Air Volume (L)	Total Metal (ug)	Concentration (ug/m³)	Narrative ID
22-12-01579-001	104-A-01	12/16/2022	Arsenic (As)	558	<0.15	<0.27	
			Barium (Ba)		<0.15	<0.27	
			Cadmium (Cd)		<0.030	<0.054	
			Chromium (Cr)		<0.75	<1.4	
			Lead (Pb)		<0.15	<0.27	
			Selenium (Se)		<0.75	<1.4	
			Silver (Ag)		<0.15	<0.27	
22-12-01579-002	104-A-02	12/16/2022	Arsenic (As)	559	<0.15	<0.27	
			Barium (Ba)		<0.15	<0.27	
			Cadmium (Cd)		<0.030	<0.054	
			Chromium (Cr)		<0.75	<1.4	
			Lead (Pb)		<0.15	<0.27	
			Selenium (Se)		<0.75	<1.4	
			Silver (Ag)		<0.15	<0.27	
22-12-01579-003	104-A-03	12/16/2022	Arsenic (As)	682	<0.15	<0.22	
			Barium (Ba)		<0.15	<0.22	
			Cadmium (Cd)		<0.030	<0.044	

Client Number: 26-3514 Report Number: 22-12-01579

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

Lab Sample Number	Client Sample Number	Analyzed Date	Analyte	Air Volume (L)	Total Metal (ug)	Concentration (ug/m³)	Narrative ID
			Chromium (Cr)		<0.75	<1.1	
			Lead (Pb)		<0.15	<0.22	
			Selenium (Se)		<0.75	<1.1	
			Silver (Ag)		<0.15	<0.22	
22-12-01579-004	104-A-04	12/16/2022	Arsenic (As)	683	<0.15	<0.22	
			Barium (Ba)		<0.15	<0.22	
			Cadmium (Cd)		<0.030	<0.044	
			Chromium (Cr)		<0.75	<1.1	
			Lead (Pb)		<0.15	<0.22	
			Selenium (Se)		<0.75	<1.1	
			Silver (Ag)		<0.15	<0.22	
22-12-01579-005	104-A-05	12/16/2022	Arsenic (As)	653	<0.15	<0.23	
			Barium (Ba)		<0.15	<0.23	
			Cadmium (Cd)		<0.030	<0.046	
			Chromium (Cr)		<0.75	<1.2	
			Lead (Pb)		<0.15	<0.23	
			Selenium (Se)		<0.75	<1.2	
			Silver (Ag)		<0.15	<0.23	
22-12-01579-006	104-A-06	12/16/2022	Arsenic (As)	519	<0.15	<0.29	
			Barium (Ba)		<0.15	<0.29	
			Cadmium (Cd)		<0.030	<0.058	
			Chromium (Cr)		<0.75	<1.5	
			Lead (Pb)		<0.15	<0.29	
			Selenium (Se)		<0.75	<1.5	
			Silver (Ag)		<0.15	<0.29	

Client Number: 26-3514 Report Number: 22-12-01579

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

Lab Sample Number	Client Sample Number	Analyzed Date	Analyte	Air Volume (L)	Total Metal (ug)	Concentration (ug/m³)	Narrative ID
22-12-01579-007	104-A-07	12/16/2022	Arsenic (As)	510	<0.15	<0.30	
			Barium (Ba)		<0.15	<0.30	
			Cadmium (Cd)		<0.030	<0.059	
			Chromium (Cr)		<0.75	<1.5	
			Lead (Pb)		<0.15	<0.30	
			Selenium (Se)		<0.75	<1.5	
			Silver (Ag)		<0.15	<0.30	
22-12-01579-008	104-A-08	12/16/2022	Arsenic (As)	546	<0.15	<0.28	
			Barium (Ba)		<0.15	<0.28	
			Cadmium (Cd)		<0.030	<0.055	
			Chromium (Cr)		<0.75	<1.4	
			Lead (Pb)		<0.15	<0.28	
			Selenium (Se)		<0.75	<1.4	
			Silver (Ag)		<0.15	<0.28	
22-12-01579-009	104-A-09	12/16/2022	Arsenic (As)	450.9	<0.15	<0.34	
			Barium (Ba)		<0.15	<0.34	
			Cadmium (Cd)		<0.030	<0.067	
			Chromium (Cr)		<0.75	<1.7	
			Lead (Pb)		<0.15	<0.34	
			Selenium (Se)		<0.75	<1.7	
			Silver (Ag)		<0.15	<0.34	
22-12-01579-010	104-A-10	12/16/2022	Arsenic (As)	451.8	<0.15	<0.34	
			Barium (Ba)		<0.15	<0.34	
			Cadmium (Cd)		<0.030	<0.067	
			Chromium (Cr)		<0.75	<1.7	

Environmental Hazards Services, L.L.C

Client Number: 26-3514 Report Number: 22-12-01579

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

Lab Sample Number	Client Sample Number	Analyzed Date	Analyte	Air Volume (L)	Total Metal (ug)	Concentration (ug/m³)	Narrative ID
			Lead (Pb)		<0.15	<0.34	
			Selenium (Se)		<0.75	<1.7	
			Silver (Ag)		<0.15	<0.34	
22-12-01579-011	104-A-11	12/16/2022	Arsenic (As)	0	<0.15	---	
			Barium (Ba)		<0.15	---	
			Cadmium (Cd)		<0.030	---	
			Chromium (Cr)		<0.75	---	
			Lead (Pb)		<0.15	---	
			Selenium (Se)		<0.75	---	
			Silver (Ag)		<0.15	---	

Sample Narratives:

Method: NIOSH 7300M

Analyst: Max Dichek

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 15mL volume. The reporting limit is 0.03ug for Cadmium, 0.15ug for Arsenic, Barium, Lead and Silver, and 0.75ug for Chromium and Selenium.

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/m³ = micrograms per cubic meter
	mL = milliliter	L= Liters

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	314-302-4661	Email	alanstaett@burnsmcd.com
Project Name / Testing Address	GFC / 4300 Goodfellow Blvd		
PO Number	168765	Collected By	Abiodun Akinola | Jeff Smith

Turn-Around Time: ● 5 DAY ○ 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		104-A-01	12/6/22 12:30								Ag, As, Ba, Cd, Cr, Pb, Se						219	2.55	558	NA x
2		104-A-02	✓ 12:35														219	2.55	559	x
3		104-A-03	✓ 1209														263	2.60	682	x
4		104-A-04	✓ 12:13														271	2.52	683	x
5		104-A-05	✓ 12:20														257	2.54	653	x
6		104-A-06	✓ 12:39														205	2.53	519	x
7		104-A-07	✓ 12:45														201	2.54	540	x
8		104-A-08	✓ 12:50														216	2.53	546	x
9	12/7/22	104-A-09	✓ 1117														180	2.51	450.9	x
10	12/7/22	104-A-10	✓ 1122														180	2.51	451.8	x
11	12/7/22	104-A-11	✓														—	—	—	x
12																				x
13																				x
14																				x
15																				x

Released By: Abiodun Akinola Date: 12/9/22 Time: 1300

Signature: (b) (6)

LAB USE ONLY – BELOW THIS LINE

Received By: T Hogan

Signature: (b) (6)

Date: 12/12/22 Time: 14: ☐ AM ☐ PM

☐ Portal Contact Added

22-12-01579

Due Date: 12/19/2022 (Monday)

EL MM-L

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

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com