January 11, 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. 105E 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 1, 2021, Ashley Anstaett and Emily Pulcher of Burns & McDonnell 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 105E.

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 105E for each of the seven (7) metals that were sampled. Results indicate that all 7 air samples collected from Building 105E and analyzed for RCRA metals were below their respective OSHA Permissible Exposure Limit (PEL), as based on a time-weighted-average.

Table 1. Summary of Air Sampling Results

Analyte	Lowest Concentration[(a)] ($\mu g/m^3$) [(b)]	Highest Concentration[(a)] ($\mu g/m^3$) [(b)]	Permissible Exposure Limit (PEL) ($\mu g/m^3$) [(b)]
Arsenic	<0.27	<0.32	10
Barium	<0.27	<0.32	500
Cadmium	<0.053	<0.063	5
Chromium (Total)	<1.4	<1.6	500
Lead	<0.27	<0.32	50
Selenium	<1.4	<1.6	200
Silver	<0.27	<0.32	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) $\mu g/m^3$ = 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 General Services Administration 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]
105E-A-01	1st floor, south lobby windowsill by column L51	Arsenic	< 0.27	µg/m^3	10
		Barium	< 0.27	µg/m^3	500
		Cadmium	< 0.053	µg/m^3	5
		Chromium	< 1.4	µg/m^3	500
		Lead	< 0.27	µg/m^3	50
		Selenium	< 1.4	µg/m^3	200
		Silver	< 0.27	µg/m^3	10
105E-A-02	2nd floor, table in office, south printer area	Arsenic	< 0.28	µg/m^3	10
		Barium	< 0.28	µg/m^3	500
		Cadmium	< 0.056	µg/m^3	5
		Chromium	< 1.4	µg/m^3	500
		Lead	< 0.28	µg/m^3	50
		Selenium	< 1.4	µg/m^3	200
		Silver	< 0.28	µg/m^3	10
105E-A-03	2nd floor, north lobby, top of drinking fountain by column N43	Arsenic	< 0.29	µg/m^3	10
		Barium	< 0.29	µg/m^3	500
		Cadmium	< 0.057	µg/m^3	5
		Chromium	< 1.5	µg/m^3	500
		Lead	< 0.29	µg/m^3	50
		Selenium	< 1.5	µg/m^3	200
		Silver	< 0.29	µg/m^3	10
105E-A-04	2nd floor, top shelf in "Common Computer #1" cubicle	Arsenic	< 0.28	µg/m^3	10
		Barium	< 0.28	µg/m^3	500
		Cadmium	< 0.056	µg/m^3	5
		Chromium	< 1.4	µg/m^3	500
		Lead	< 0.28	µg/m^3	50
		Selenium	< 1.4	µg/m^3	200
		Silver	< 0.28	µg/m^3	10
105E-A-05	Warehouse, top of x-ray machine	Arsenic	< 0.31	µg/m^3	10
		Barium	< 0.31	µg/m^3	500
		Cadmium	< 0.061	µg/m^3	5
		Chromium	< 1.6	µg/m^3	500
		Lead	< 0.31	µg/m^3	50
		Selenium	< 1.6	µg/m^3	200
		Silver	< 0.31	µg/m^3	10

Appendix A
Results Summary by Location

Sample Number	Location	Analyte	Result	Units	Recommended Limits[1]
105E-A-06	Warehouse, south end of room on shelf	Arsenic	< 0.32	µg/m^3	10
		Barium	< 0.32	µg/m^3	500
		Cadmium	< 0.063	µg/m^3	5
		Chromium	< 1.6	µg/m^3	500
		Lead	< 0.32	µg/m^3	50
		Selenium	< 1.6	µg/m^3	200
		Silver	< 0.32	µg/m^3	10
105E-A-07	Field blank	Arsenic	< 0.15	µg	--
		Barium	< 0.15	µg	--
		Cadmium	< 0.030	µg	--
		Chromium	< 0.75	µg	--
		Lead	< 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)

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: 21-12-00471
Received Date: 12/03/2021
Reported Date: 12/09/2021

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	Analyzed Date	Analyte	Air Volume (L)	Total Metal (ug)	Concentration (ug/m³)	Narrative ID
21-12-00471-001	105E-A-01	12/08/2021	Arsenic (As)	569	<0.15	<0.27	
			Barium (Ba)		<0.15	<0.27	
			Cadmium (Cd)		<0.030	<0.053	
			Chromium (Cr)		<0.75	<1.4	
			Lead (Pb)		<0.15	<0.27	
			Selenium (Se)		<0.75	<1.4	
			Silver (Ag)		<0.15	<0.27	
21-12-00471-002	105E-A-02	12/08/2021	Arsenic (As)	538	<0.15	<0.28	
			Barium (Ba)		<0.15	<0.28	
			Cadmium (Cd)		<0.030	<0.056	
			Chromium (Cr)		<0.75	<1.4	
			Lead (Pb)		<0.15	<0.28	
			Selenium (Se)		<0.75	<1.4	
			Silver (Ag)		<0.15	<0.28	
21-12-00471-003	105E-A-03	12/08/2021	Arsenic (As)	533	<0.15	<0.29	
			Barium (Ba)		<0.15	<0.29	
			Cadmium (Cd)		<0.030	<0.057	

Client Number: 26-3514 Report Number: 21-12-00471

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	<1.5	
			Lead (Pb)		<0.15	<0.29	
			Selenium (Se)		<0.75	<1.5	
			Silver (Ag)		<0.15	<0.29	
21-12-00471-004	105E-A-04	12/08/2021	Arsenic (As)	536	<0.15	<0.28	
			Barium (Ba)		<0.15	<0.28	
			Cadmium (Cd)		<0.030	<0.056	
			Chromium (Cr)		<0.75	<1.4	
			Lead (Pb)		<0.15	<0.28	
			Selenium (Se)		<0.75	<1.4	
			Silver (Ag)		<0.15	<0.28	
21-12-00471-005	105E-A-05	12/08/2021	Arsenic (As)	493	<0.15	<0.31	
			Barium (Ba)		<0.15	<0.31	
			Cadmium (Cd)		<0.030	<0.061	
			Chromium (Cr)		<0.75	<1.6	
			Lead (Pb)		<0.15	<0.31	
			Selenium (Se)		<0.75	<1.6	
			Silver (Ag)		<0.15	<0.31	
21-12-00471-006	105E-A-06	12/08/2021	Arsenic (As)	483	<0.15	<0.32	
			Barium (Ba)		<0.15	<0.32	
			Cadmium (Cd)		<0.030	<0.063	
			Chromium (Cr)		<0.75	<1.6	
			Lead (Pb)		<0.15	<0.32	
			Selenium (Se)		<0.75	<1.6	
			Silver (Ag)		<0.15	<0.32	

Environmental Hazards Services, L.L.C

Client Number: 26-3514 Report Number: 21-12-00471

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
21-12-00471-007	105E-A-07	12/08/2021	Arsenic (As)	--	<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: Kailee Guthrie

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

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 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	eapulcher@burnsmcd.com
Project Name / Testing Address	GFC / 4300 Goodfellow Blvd		
PO Number	168765	Collected By	Emily Pulcher & 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	105E-A-01	12/1/21 1037								Ag, As, Ba, Cd, Cr, Pb, Se						219	2.6	569	x
2	105E-A-02	1038														215	2.5	538	x
3	105E-A-03	1041														209	2.5	533	x
4	105E-A-04	1041														210	2.5	536	x
5	105E-A-05	1048														197	2.5	493	x
6	105E-A-06	1049														197	2.5	483	x
7	105E-A-07	0647														NA	NA	NA	x
8																			x
9																			x
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) [redacted]

LAB USE ONLY – BELOW THIS LINE

Received By: TStone

Signature: (b) (6) [redacted]

Date: 12/3/21 Time: 1:13 ☐ AM ☑ PM

☐ Portal Contact Added

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

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

21-12-00471

Due Date: 12/10/2021 (Friday)

EL MM-L