

**ERIO CONSULTING  
MARY J. ERIO, PE, CIH, CSP  
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KANSAS CITY, MO 64110  
(816) 753-9030**

November 15, 2003

Mr. David L. Hartshorn, CIH, CSP, CHMM  
Property Management Division  
U.S. General Services Administration  
1500 E. Bannister Road, Room 2101  
Kansas City, MO 64131-3088

RE: Sampling for Lead and Mercury dust  
Goodfellow Child Care Center  
Federal Center  
St. Louis, MO

Dear Dave:

Attached is the report for the lead and mercury sampling at the above facility. The remediation plan and cost estimate will be included in a separate report, after the area of remediation is estimated.

If you have any questions concerning this report, please contact me.

Sincerely,

Mary J. Erio

Report follows

**Sampling for Lead and Mercury  
October 2 to 3, 2003**

**Federal Center  
Child Care Center, Building 104E  
4300 Goodfellow  
St. Louis, MO 63120**

**November 15, 2003**

**Erio Consulting  
Mary J. Erio, PE, CIH, CSP  
3927 Kenwood  
Kansas City, MO 64110**

## **TABLE OF CONTENTS**

- I. INTRODUCTION
- II. SUMMARY OF THE SAMPLING
- III. RESULTS
- IV. DISCUSSION
- V. CONCLUSIONS AND RECOMMENDATIONS

ATTACHMENT – LABORATORY ANALYSIS REPORT

## INTRODUCTION

From October 2 to 3, 2003, Mary J. Erio, PE, CIH, CSP (the investigator) collected samples for lead and mercury at the Child Care Center, located at 4300 Goodfellow, Building 104E, Federal Center, St. Louis, MO. The sampling was requested by the U.S. General Services Administration (GSA) in response to potential health concerns following the discovery of peeling paint above the drop ceiling within the facility.

The Child Care Center comprises approximately 8,000 square feet and cared for 34 children at the time of the investigation. The sampling took place while the facility was closed for the night, after 5:30 p.m. The investigation was coordinated with Ms. Barbara Daniels, Regional Child Care Coordinator for GSA, along with building staff.

According to GSA, a contractor discovered peeling paint above the drop ceiling when the ceiling panel was raised, causing paint chips to fall on the floor. Analysis of the paint chips showed both lead and mercury. Building management has been advised to raise ceiling tiles only when using appropriate safety methods. Direct reading instruments have shown no immediate health hazards from mercury vapor or particulates. However, chemical samples were requested to evaluate any risk from paint dust that might have escaped past the ceiling tiles into the childcare areas. The peeling paint is located on the decking above the drop ceiling. The space above the ceiling tiles serves as a return air plenum. No lead-based or mercury-based painted surfaces have been identified within the occupied spaces.

Specifically, the following items were requested:

1. Air samples for Lead to confirm that there's no airborne hazard. Determine if concentrations detected from this sampling effort are acceptable or unacceptable for a day care facility.
2. Collect carpet vacuum samples for Lead and Mercury to determine if the paint has gotten into the carpet. Determine if concentrations detected from this sampling effort are acceptable or unacceptable for a day care facility.
3. Collect wipe samples from surfaces in the day care center occupied by children, which are not typically cleaned to see if there's a settling-out of Lead or Mercury. Determine if concentrations detected from this sampling effort are acceptable or unacceptable for a day care facility.
4. Develop a scope and cost estimate to (a) clean the upper surface of the ceiling tiles and (b) control future peeling of the paint from the underside of the roof decking.
5. Provide recommendations for interim control measures, if needed, to ensure the safety of the day care occupants until remediation can be accomplished

## **II. SUMMARY OF SAMPLING**

The investigator arrived at the Child Care Center shortly before closing on Thursday, October 2, 2003 and toured the facility. At least one sample type was collected in each room or hallway commonly occupied by children. Sampling began after closure, and after the arrival of the cleaning crew.

The following is a summary of the samples and sample methods:

### **Lead Wipe Samples**

Wipe samples are important in assessing the potential contact a child might have with a contaminated surface. A total of four lead wipe samples were collected from the floor tiles in three childcare rooms and the hallway. These are high occupancy areas. The exact locations can be found in the Results section. The cleaning crew appeared to be cleaning horizontal, hard surfaces, where dust could settle. Therefore, the samples were collected prior to daily cleaning.

The wipe samples were collected according to the HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (June, 1995), Appendix 13.1 “Wipe Sampling for Settled Lead Contaminated Dust”. Environmental Health Laboratory provided the wipe sample media, “Ghost Wipes”. They meet the requirements of HUD and ASTM E 1792 “Standard Specification for Wipe Sampling Materials for Lead in Surface Dust”. Samples were collected using disposable one-foot square templates and disposable, powderless latex gloves, changed with each sample.

Each wipe sample was placed in a Nasco Whirl-Pak, supplied by Environmental Health Laboratory, and labeled. One media blank, Wipe 1, was removed from the package, folded, and placed in the Whirl-Pak, but no sample was collected.

### **Mercury Wipe Samples**

A total of two mercury wipe samples were collected in two childcare rooms. The mercury wipe was collected adjacent to the lead wipe. The mercury wipe sample collection method was equivalent to the lead wipe method, except for the sample media. Environmental Health Laboratory provided Kim-wipes and distilled water to moisten each wipe. One media blank, Wipe 8, was removed from the package, wetted with distilled water, folded, and placed in the Whirl-Pak, but no sample was collected.

### **Lead and Mercury Dust Samples**

A total of four samples were collected and analyzed for lead dust in carpet and rugs in three child care rooms and the hallway. Two of these samples were also analyzed for mercury. The exact locations can be found in the Results section. In general, the Child Care Center was not carpeted except for the loft areas in some child care rooms, and a

bench along the East Wall. Rugs are located in each room, and a mat is located at the entrance of each room. The mats and rugs are vacuumed daily during mid-afternoon. The night crew only sweeps the mats. The samples were collected prior to this sweeping. One sample, Dust 2 was also collected from the Purple Room loft carpet, near water damaged ceiling tiles and where paint was peeling above the ceiling tiles.

The samples were collected according to recommendations from Environmental Health Laboratory, and in a manner similar to CarpetChek dust collection methods. The laboratory also supplied the 0.8-micron mixed cellulose ester membrane filter (MCEF) cassettes. A one-foot square disposable template was used with each sample.

To collect a carpet dust sample, a short, disposable “tygon” plastic tube was attached to the inlet end of the cassette. A variable volume EMS pump was set to a flow rate of 15 liters per minute. The investigator collected dust into the cassette by moving the tubing in an “S” shape motion in both directions along the carpet fibers. Following sample collection, the cassette was closed and labeled. One media blank, Dust 5, was also analyzed for lead and mercury.

### **Lead in Air**

Three air samples were collected and analyzed for airborne lead dust. The locations are listed in the Results section. The samples were collected in areas possibly affected by supply air dust, beneath supply air grills and areas with previous water damage. The ventilation system was allowed to operate all night.

The area samples were collected according to a modified NIOSH Method No. 7082, Airborne Particulates for Lead. Since the samples were collected in a childcare center, a longer sampling period was used than for a workplace. Environmental Health Laboratory supplied the 0.8-micron MCEF cassettes. The pumps, two Sensidyne BDX II and one EMS, were calibrated to 3 liters per minute, plugged into electrical outlets, and were allowed to run all night, or approximately 11 hours. The investigator collected the samples prior to the arrival of children on November 3, 2003.

The media blank submitted with the dust samples, Dust 5, also serves as a media blank for the air samples.

All samples were sent Environmental Health Laboratory, an accredited Industrial Hygiene laboratory located in Cromwell, Connecticut.

### III. RESULTS

The sampling results are summarized in the following tables. Additional information, including the Chain of Custody, can be found in the Attachments section.

#### Lead Wipes, October 2, 2003

Sample No.	Location	Wipe Area (sq ft)	µg/sq ft
Wipe 2	Purple Room, floor tile beneath stained ceiling tiles, 6 feet from east wall, 17 feet from south wall	1	< 2.5
Wipe 4	Blue Room, floor tile, center	1	< 2.5
Wipe 5	South Hall, floor tile near mats	1	< 2.5
Wipe 7	Yellow Room, floor tile near cribs, beneath air vent	1	< 2.5
EPA and HUD guideline for lead dust on floor			40

#### Mercury Wipes, October 2, 2003

Sample No.	Location	Wipe Area (sq ft)	µg/sq ft
Wipe 3	Purple Room, beneath stained ceiling tiles, 6 feet from east wall, 17 feet from south wall	1	< 0.18
Wipe 6	Yellow Room, floor tile near cribs, beneath air vent	1	< 0.18

#### Lead dust in carpet, October 2, 2003

Sample No.	Location	Sample Area (sq ft)	µg/sq ft
Dust 1	Green Room, dust from black floor mat in doorway	1	4.6
Dust 2	Purple Room, dust from carpet in loft, near steps, southeast corner of room	1	14
Dust 3	Hallway, dust from carpet on bench along east wall, outside of Orange Room	1	13
Dust 4	Green Room, dust from multi-colored rug near west door	1	4.3
EPA and HUD guideline for lead dust on floor			40

**Mercury dust in carpet, October 2, 2003**

Sample No.	Location	Sample Area (sq ft)	µg/sq ft
Dust 2	Purple Room, dust from carpet in loft, near steps, southeast corner of room	1	< 0.22
Dust 3	Hallway, dust from carpet on bench along east wall, outside of Orange Room	1	< 0.22

**Lead in air, October 2 to 3, 2003**

Sample No.	Location	Sample Time (min)	Mg/m <sup>3</sup>
Air 1	Yellow Room, partition between Yellow room and Orange Room, near Entrance.	675	< 0.00033
Air 2	Purple Room, table near wipe samples	675	< 0.00035
Air 3	Blue Room, table near loft	643	< 0.00036
EPA National Primary and Secondary Ambient Air Quality Standard averaged over a calendar quarter			0.0015

Notes for all Tables:

µg/sq ft = micrograms per square foot area

mg/m<sup>3</sup> = milligrams per cubic meter of air

< less than limit of detection

#### IV. DISCUSSION

Based on the sample results, and visual observations, the following comments can be made:

1. In general, the sample results reflect the general cleanliness maintained within the Child Care Center.
2. A small amount of lead dust was detected in carpet and rug dust samples, well below the HUD guideline. Since lead contamination is common in the environment, the low lead level found in the Child Care Center might have been brought in on clothing and shoes from outside sources.
3. The lead air sample results were compared with the EPA ambient air standard, since workplace standards are not applicable to children. The OSHA workplace standard is 0.05 mg/m<sup>3</sup>. The EPA ambient air standard applies to sensitive populations, such as children.
4. The air samples were placed in potential “worst case” areas, such as below a supply air vent, and near the location of water stained ceiling tiles and peeling paint. All lead air levels were non-detectable and far below the EPA ambient air standard.
5. No surface dust health limits or recommendations were found for inorganic mercury. Recommendations were found for mercury vapor level. Mercury vapor was previously evaluated using a real-time instrument. EPA has calculated an oral reference dose for inorganic mercury for use at hazardous waste sites of 0.3 microgram/kg/day. For a 20 kg (44 lb) child, the recommended maximum daily ingestion is 6 micrograms of inorganic mercury from all sources, including food. No mercury was detected in the samples, indicating children have extremely low, if any, contact with mercury-contaminated dust within the Child Care Center.
6. The investigator was only able to observe the ceiling above the ceiling tiles at several locations without a ladder, mainly the lofts located in the child care rooms. Peeling paint was observed in only one location, above water damaged ceiling tiles located in the Purple Room. The cleaning staff indicated that no active water leak has been observed there for at least two years.

## V. CONCLUSIONS AND RECOMMENDATIONS

The sampling results did not show any surface wipe or carpet mercury-contaminated particulates above the detection limit of 0.2 microgram per square foot. Lead was not detected in surface wipes or in air samples above the detection limit. Lead was detected in carpet dust at levels far below the EPA and HUD guidelines for surface lead dust.

Therefore, the current risk to children at the Child Care Center from peeling lead and mercury paint located above the drop ceiling appears to be very low. Any settled dust is generally cleaned on a daily basis. No additional interim controls are necessary at this time.

Nevertheless, some remediation of the peeling paint is recommended if the Child Care Center is to continue operation for a period of time. Remediation would only be necessary for the areas with peeling paint, which is most likely not the entire ceiling area. The work would take place over a weekend, when children do not occupy the center.

General remediation of peeling paint above the drop ceil should include the following:

1. Move furniture and toys from affected area, cover with plastic. Turn off the ventilation system.
2. Place a portable scaffold to reach above the drop ceiling. Remove ceiling tiles in selected area, clean the top side with HEPA vacuum, place on plastic, and damp wipe.
3. Scrape peeling paint and collect paint chips with HEPA vacuum and plastic sheeting.
4. Paint a high-solids encapsulant over the affected area.
5. Replace ceiling tiles, furniture, etc. and remove plastic and debris from facility. New ceiling tiles should replace any water damaged ceiling tiles.

### **Cost Estimate Recommendation**

A cost estimate and plan for the above remediation can be developed following the evaluation and location of areas of peeling paint. This evaluation should take place after hours, since ceiling tiles should be lifted in two to three locations per room and hallway. The investigator will be equipped with a portable HEPA vacuum to clean any paint chips that fall. Plastic sheeting will also help keep floors clean during the evaluation.

**ATTACHMENT**

**LABORATORY ANALYSIS REPORT**

**LEAD AND MERCURY SAMPLES  
OCTOBER 2 TO 3, 2003**

**GOODFELLOW CHILD CARE CENTER,  
ST. LOUIS, MO**

**LABORATORY ANALYSIS REPORT**

**Environmental Health Laboratory**  
100 Sebethe Drive, Suite A-5  
Cromwell, CT 06416  
(800) 243-4903 or (860) 635-6475



State of Connecticut Approval #PH 0510  
Lab Accreditations: AIHA #144, AIHA ELLAP #6945

To: Mary Erio  
Erio Consulting  
3927 Kenwood  
Kansas City, MO 64110

**Report #: C0314948**

P.O. No.: GSA-St. Louis

Date Received: 10/6/2003

Date Reported: 10/14/2003

Page 1 of 2

Analysis: Metal Wipes  
Analytical Method: Inductively Coupled Plasma; Modified OSHA ID 125

Sample Number	Wipe Area (sq. ft.)	Component	ug	ug/ft <sup>2</sup>
Wipe 2	1.00	Lead	<2.50	<2.5
Wipe 4	1.00	Lead	<2.50	<2.5
Wipe 5	1.00	Lead	<2.50	<2.5
Wipe 7	1.00	Lead	<2.50	<2.5
Wipe 1-Blank	---	Lead	<2.50	Detection Limit: 2.50 ug

Analysis: Metals  
Analytical Method: Inductively Coupled Plasma; Modified OSHA ID 125

Sample Number	Wipe Area (sq. ft.)	Component	ug	ug/ft <sup>2</sup>
Dust 1	1.00	Lead	4.60	4.6
Dust 2	1.00	Lead	14.1	14
Dust 3	1.00	Lead	13.2	13
Dust 4	1.00	Lead	4.29	4.3
Dust 5	---	Lead	<2.25	Detection Limit: 2.25 ug

(b) (6)

Analyst: Karin Tobin and Carol Feyerabend

(b) (6)

Date: 10/14/2003

Analysis: Mercury

Analytical Method: Atomic Absorption Spectrophotometry; Hydride Generation OSHA ID #145

Sample Number	Area sq. feet	Component	ug	Concentration	Units
Dust 2	1.00	Mercury	<0.225	<0.22	ug/ft <sup>2</sup>
Dust 3	1.00	Mercury	<0.225	<0.22	ug/ft <sup>2</sup>
Dust 5	---	Mercury	<0.225	Detection Limit: 0.225 ug	

Analysis: Metals in Air

Analytical Method: Inductively Coupled Plasma; Modified OSHA ID 125

Sample Number	Air Volume (Liters)	Component	ug	Concentration	Units
Air 1	2280	Lead	<0.750	<0.00033	mg/m <sup>3</sup>
Air 2	2140	Lead	<0.750	<0.00035	mg/m <sup>3</sup>
Air 3	2090	Lead	<0.750	<0.00036	mg/m <sup>3</sup>
Detection Limit	---	Lead	0.750 ug	Detection Limit: 0.750 ug	

Concentrations reported are based on air volumes provided.  
A blank was not submitted with the samples.

Analysis: Mercury Wipes

Analytical Method: Atomic Absorption Spectrophotometry; Hydride Generation OSHA ID #145

Sample Number	Wipe Area sq. feet	Component	ug	Concentration	Units
Wipe 3	1.00	Mercury	<0.175	<0.18	ug/ft <sup>2</sup>
Wipe 6	1.00	Mercury	<0.175	<0.18	ug/ft <sup>2</sup>
Wipe 8	---	Mercury	<0.175	Detection Limit: 0.175 ug	

Analyst: Jessica A. Mitchell

(b) (6)

Date: 10/14/2003

<b>Environmental Health Laboratory</b> ESIS Risk Control Services One of the ACE Group of Companies  100 Sebethe Drive Suite A-5 Cromwell, CT 06416 (860) 635-6475; (800) 243-4903 FAX (860) 635-6750  <b>REQUEST FOR ANALYTICAL SERVICES</b> (Please Fill all blanks to help us better serve you)	<input checked="" type="checkbox"/> <b>Standard TAT</b> <input type="checkbox"/> <b>RUSH</b> Please call ahead for Rush analysis. Additional charges apply.	<b>FOR LAB USE ONLY</b> Lab Report No. CO314928 <input type="checkbox"/> Und <input type="checkbox"/> SRF <input type="checkbox"/> AR <input type="checkbox"/> ESIS <input type="checkbox"/> Z <input type="checkbox"/> Claims Pol. Or Con. No.
	10/6/03	

Send INVOICE To [REQUIRED]	Send RESULTS To [REQUIRED]
Name: <u>Mary Erio</u>	Name: <u>SAMF</u>
Company: <u>Erio Consulting</u>	Company:
Mailing Address: <u>3927 KENNEDY</u>	Mailing Address:
City, State, Zip: <u>Kansas City MO 64110</u>	City, State, Zip:
PO#, Ref # (If Required): <u>GSA - ST LOUIS</u>	Phone No: <input type="checkbox"/> Phone Results
Accts. Payable Phone No: <u>(816) 753-9030</u>	Fax No: <input type="checkbox"/> Fax Results
Accts. Payable Fax No:	Email: <u>merida@mind spring.com</u> <input type="checkbox"/> Email Results
Sampling Location:	Sampling Media:
Product Manufactured/Service Rendered:	Sampling Method:

<b>CHAIN OF CUSTODY</b>	Collected by (print name): <u>(b) (6)</u>	Collector's Signature:	Date/Time:
	Relinquished by: <u>(b) (6)</u>	Date/Time: <u>10/03/03</u>	Received by:
	Relinquished by: <u>(b) (6)</u>	Date/Time:	Received by:
	Method of Shipment: <u>Fed Ex</u>	Date: <u>10/30/03</u>	Received at Lab by: <u>(b) (6)</u>

Sample Condition Upon Receipt:  Acceptable  Unacceptable

EHL SAMPLE NO (Lab Use Only)	SAMPLE CONTAINER NO	Media Type	ANALYSIS DESIRED A 3 sample minimum charge applies when less than 3 of each specific analyte is requested.	NOTES Recording Analyte tag, Location and Operation, Other compounds present, etc.)	SAMPLING RATE (liters/min)	SAMPLING TIME		Total Time (minutes)	SAMPLE VOLUME (liters)
						Start	End		
<u>Dust 1</u>	<u>1</u>	<u>Sheet</u>	<u>Lead</u>	<u>Hall Mat</u>	<u>1ft<sup>2</sup></u>				
<u>Dust 2</u>	<u>"</u>	<u>"</u>	<u>Lead, Mercury</u>	<u>Purple Rm</u>	<u>1ft<sup>2</sup></u>				
<u>Dust 3</u>	<u>"</u>	<u>"</u>	<u>Lead, Mercury</u>	<u>East wall</u>	<u>1ft<sup>2</sup></u>				
<u>Dust 4</u>	<u>"</u>	<u>"</u>	<u>Lead</u>	<u>Green Rm</u>	<u>1ft<sup>2</sup></u>				
<u>Dust 5</u>	<u>"</u>	<u>"</u>	<u>Lead, Mercury</u>	<u>Blank</u>	<u>---</u>				
<u>Air 1</u>	<u>"</u>	<u>"</u>	<u>Lead</u>	<u>Yellow Rm</u>	<u>3.38</u>	<u>1925</u>	<u>640</u>	<u>675</u>	<u>2282</u>
<u>Air 2</u>	<u>"</u>	<u>"</u>	<u>Lead</u>	<u>Purple Rm</u>	<u>3.17</u>	<u>1930</u>	<u>645</u>	<u>675</u>	<u>2140</u>
<u>Air 3</u>	<u>"</u>	<u>"</u>	<u>Lead</u>	<u>Blue Rm</u>	<u>3.25</u>	<u>1900</u>	<u>643</u>	<u>675</u>	<u>2090</u>
<u>Wipe 1</u>	<u>Ghost wipe</u>	<u>---</u>	<u>Lead</u>	<u>Blank</u>	<u>---</u>				
<u>Wipe 2</u>	<u>GW</u>	<u>---</u>	<u>Lead</u>	<u>Purple Rm</u>	<u>1ft<sup>2</sup></u>				
<u>Wipe 3</u>	<u>Kim wipe</u>	<u>---</u>	<u>Mercury</u>	<u>Purple Rm</u>	<u>1ft<sup>2</sup></u>				
<u>Wipe 4</u>	<u>GW</u>	<u>---</u>	<u>Lead</u>	<u>Blue Rm</u>	<u>1ft<sup>2</sup></u>				
<u>Wipe 5</u>	<u>GW</u>	<u>---</u>	<u>Lead</u>	<u>Hallway</u>	<u>1ft<sup>2</sup></u>				
<u>Wipe 6</u>	<u>GW</u>	<u>---</u>	<u>mercury</u>	<u>Yellow Rm</u>	<u>1ft<sup>2</sup></u>				
<u>Wipe 7</u>	<u>GW</u>	<u>---</u>	<u>Lead</u>	<u>Yellow Rm</u>	<u>1ft<sup>2</sup></u>				

FOR LAB NOTES ONLY: Dust 1-4 - pulled from carpet dust  
Need results in mg/ft<sup>2</sup>  
emailed 10-14-03  
3:20 PM

