

December 8, 2021

Mr. Jeff Klenk  
Mr. Chris Madden, CIH  
Office of the Environment - Howard County Public School System  
10910 Route 108  
Ellicott City, MD 21042

SUBJECT: Gym Floor Removal Report for Waterloo Elementary School  
Project Number J20-1275

Dear Mr. Madden and Mr. Klenk,

Aria Environmental, Inc. (AE) conducted mercury vapor monitoring for the mercury-containing gym floor removal project at Waterloo Elementary School from June 16 to July 9, 2021. The gym floor removal was conducted by Asbestos Specialist Inc. (ASI) of Elkridge, Maryland using ride-on floor scraping equipment. After the wooden rubber flooring was removed, a ride-on shot blasting unit was used to remove rubber residue from the concrete substrate and level floor for new flooring material. The mercury vapor and dust concentrations were controlled by a negative air enclosure system with HEPA and charcoal-filtered negative air machines. Manometers were in place to keep the enclosures at least at -0.02 inches water column.

**Equipment used by AE:**

Ohio Lumex 915M Mercury Vapor Analyzer calibrated on 01/29/2021 (direct reading instrument)  
TSI IAQCalc Monitor for temperature and relative humidity measurements

**Mercury Vapor Guideline Used by AE and HCPSS:**

Mercury vapor concentrations were compared to widely accepted guidelines from the Minnesota Department of Health (MDH) and New Jersey Department of Health (NJDH), which indicate that indoor air concentrations below **750 nanograms per cubic meter (ng/m<sup>3</sup>)** are protective of preschool-aged children, and thus also deemed safe for older children and adults.

**Issues encountered during the Project and Strategies Used to Resolve Them:**

**Issue:** Mercury vapor concentrations were above the target concentration (750 ng/m<sup>3</sup>) after the rubber gym floor was removed.

**Strategy:** An industrial heater was added on July 2, 2021 to the negative air gym enclosure in order to reduce mercury vapor concentrations.

**Strategy:** The gym floor was abraded by shot blasting two more times in order to release mercury vapor from the concrete floor and bring down the mercury vapor concentrations overall.

**Issue:** Upon reinspection small amounts of rubber flooring material were still visible in patches of damaged concrete and near edges of the floor.

**Strategy:** The remaining rubber was removed as much as possible using hand grinders and chisels. This was done prior to the second two shot blasting treatments.

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The following materials were removed:

- Wooden gym floor: sequestered and covered in waste dumpster, separated from rubber flooring, and disposed of as construction waste after TCLP testing.
- Floor and door transition hardware was salvaged and cleaned for reuse.
- Metal volleyball net post sockets were removed from the concrete floor for investigative purposes only and were replaced when the new floor was installed.
- Rubber gym floor: sequestered and covered in waste dumpsters and disposed of as hazardous mercury-containing waste.

Concrete floor abrasion, prolonged ventilation, and heating to above 90° F were performed to reduce mercury vapor concentrations after the rubber floors were removed. Mercury vapor concentrations were deemed acceptable by AE and HCPSS on July 9, 2021, at which time the mercury concentrations ranged from 206 to 1,183 ng/m<sup>3</sup> at a variety of heights and at a temperature of 87.8° F. Due to the elevated temperature and the overall average (515 ng/m<sup>3</sup>) being lower than 750 ng/m<sup>3</sup>, the negative air enclosure was authorized to be removed and the new floor installation was given authorization to proceed by HCPSS.

Sincerely,  
Aria Environmental, Inc.



Julie Barth, CIH, CSP, LEED Green Associate