Environmental Control Systems, Inc.

Environmental Engineers and Management Consultants

November 18, 2019

Mr. Alan Crouthamel
Director of Facilities
Palisades School District
35 Church Hill Road
Kintnersville, PA 18930

Re: Airborne Mercury Exposure Assessment

Dear Mr. Crouthamel:

On November 18, 2019, Environmental Control Systems, Inc. (ECS) was asked to conduct a proactive and voluntary airborne mercury exposure assessment in the following schools:

1. Palisades High School

Background

In the early 1960's, a new style of flooring was developed by 3M to replace gymnasium wood floors as well as school running surfaces. This new rubber-like polymer flooring, often referred as "Tartan" flooring, was promoted as an improvement over wood flooring in gymnasiums and as a durable running surface for both indoor and outdoor track and field facilities through the early 1970s and mid-1980s.

The softer texture of this flooring was achieved as a result of utilizing Mercury (Hg), which as the catalyst, remained a liquid at room temperature. The finished product typically contained 0.1% to 0.2% mercury.

Evaluation of Health Concerns

Mercury vapors are heavier than air and may linger in higher concentrations close to the floor. If flooring is found to contain mercury, the release of mercury vapors from the flooring can cause health concerns if airborne vapor amounts exceed regulatory threshold limit values.

In addition, if the flooring is found to contain mercury, regulatory issues concerning disposal will need to be addressed if the floor is ever removed and/or replaced.

Recommended Policy

Regulatory agencies recommend schools first examine their facilities to determine if they have a rubber-like gym floor then determine whether vapor emissions are an issue.

Air Sampling Method

ECS utilized a Jerome 431-X Mercury Vapor Analyzer offering real time & instantaneous direct read results reported in milligrams per meter cubed (mg/m^3). The Jerome 431-X can detect mercury vapor in air from 0.003 mg/m^3 to 0.999 mg/m^3, making it ideal for industrial hygiene monitoring, mercury spill detection/cleanup, and mercury exclusion testing.

Air sampling was performed in accordance with OSHA Method ID-145 & NIOSH Method 6009 at breathing zone height (Between 2" & 5" above floor) in a grid pattern throughout the gymnasium.

Regulatory Guidance- Workplace Exposure Limits

The OSHA permissible exposure limit (PEL) for mercury is a ceiling limit of 0.1 milligrams per cubic meter of air (mg/m^3), which is currently enforced as an 8-hour time-weighted average. Other organizations suggest lower exposure levels. The National Institute for Occupational Safety and Health (NIOSH) recommends that exposures to mercury metal be limited to an average of 0.05 mg/m^3 over a 10-hour workday, in addition to a ceiling limit of 0.1 mg/m^3. The American Conference of Governmental Industrial Hygienists (ACGIH) recommends that metallic mercury exposures be limited to an average of 0.025 mg/m^3 over an 8-hour workday.

Air Sampling Results

Palisades High School Gym – Floor is in good condition exhibiting normal wear.

Recommended Environmental & Occupational Health Standards for Inhalation Exposure of Mercury Vapor				
	OSHA - Permissible Exposure Limit (PEL)	NIOSH - Recommended Exposure Limit (REL)	ACGIH - American Conference of Governmental Industrial Hygienists Threshold Limit Value (TLV)	Quantified Airborne Test Results
	(mg/m3)	(mg/m3)	(mg/m3)	(mg/m3)
Recommended Exposure Limit (8 Hour)	0.1	0.05	0.025	
		Palisades High School Gym - Approximate Installation Date 1990		
		Average Front Hg result		< 0.01
		Average Middle Hg Result		< 0.01
		Average Back Hg Result		< 0.01
		Average Outdoor Hg Result		< 0.01

Findings

Testing was performed during school hours under normal facility and HVAC usage. As you can see from the above table, at the time of this test, all air samples obtained on this date were well below the recommended standard threshold guideline limits we follow when performing an airborne mercury exposure assessment. Outdoor background samples obtained showed trace amounts of mercury between .003 mg/m^3 and .006 mg/m^3. According to the EPA, *"Mercury is a naturally occurring element and can fall to the ground in raindrops, in dust, or simply due to gravity (known as "air deposition")."*

Recommendation(s)

As a matter of due diligence, if there are future repair and/or renovations planned for this area, it is recommended that Toxic Characteristic Leaching Procedure (TCLP) bulk sampling be obtained from the floor to determine proper disposal methods.

Mr. Crouthamel, should you have any further questions, please feel free to contact us.

Respectfully Submitted,

Wayne R. Pistoia, MSE, PE, NSPE
Operations Director