AHERA Consultants INCORPORATED

PO Box 385
Oceanville, NJ 08231-0385
E-Mail ahera@comcast.net

Fax 609.652.1140
Phone 609.652.1833

INDOOR AIR QUALITY EVALUATION REPORT

Mercury Vapor Readings

Joseph J. Catena Elementary School Gymnasium

Freehold Township School District
384 West Main Street
Freehold, NJ 07728

Survey date: 09/12/2018
Inspection performed by: John Smoyer

Section 1 Introduction

AHERA Consultants Inc. was retained by the Freehold Township School District to conduct Mercury Vapor Readings in the Joseph J. Catena Elementary School, located in Freehold, New Jersey. This sampling was performed at the request of Mr. Paul Rowan as a follow up to last month's bulk sampling event. Mercury vapor readings were conducted utilizing a Lumex RA-915M Mercury Vapor analyzer. This unit reports readings in ng/m^3.

Section 2 Physical Inspection

Existing Conditions

On September 12, 2018 I, John Smoyer, arrived at the Joseph J. Catena Elementary School and met Bob Lykes who provided access to the Gymnasium. In August, bulk sampling of the flooring material determined that the polyethylene floor contained mercury at a concentration of 180-240 mg/kg and the District requested ambient sampling be performed to establish a background.

Upon my arrival at the gym, I noted that the HVAC was operational, however, it had met the temperature setting of 72° and the system was on standby. The gym is fit with air conditioning supplied by roof-top units and exhaust fans. I performed the ambient air testing at the end of the day during a time of low occupancy. Sampling was concluded at approximately 4:15 PM. The outdoor temperature was in the mid 80's and an indoor temperature reading of 70-72° was noted. As I was conducting my sampling, Bob and I noted the levels were elevated so he went to lower the AC control unit and re-established it 68°.

Comparatively, I collected readings outside-of and directly adjacent to the southern hallway entrance to the Gym and also outside the main entrance to the building.

◊ Sampling Procedures

◊ The Lumex RA915M utilizes real time direct read results reported in nanograms per meter cubed. Several readings were conducted in various sections of the gymnasium at both the breathing level and a level of 6', 3', and 1' from the floor. The Lumex RA915M was calibrated on 04/12/2018 and was due for re-calibration on 04/13/2019.

◊ OHIO Lumex RA-915M Readings

September 12, 2018

SAMPLE ID #	SAMPLE LOCATION	Range	Height	Floor Temperature	Photo #
1	Outside Main Entrance	8 ng/m^3 8 ng/m^3 45 ng/m^3	6' 3' 1'	84°F	4
2	Gym - East	3153 ng/m^3 3140 ng/m^3	6' 3'	70°F	1
3	Gym - South	3248 ng/m^3 3287 ng/m^3	6' 3'	70°F	2
4	Hall Outside Gym Entrance	105 ng/m^3 616 ng/m^3 1408 ng/m^3	6' 3' 1'	72°F	3

Results reported in ng/m^3

Results: Samples indicate a range between 3140 ng/m^3 and 3287 ng/m^3 in the breathing zone of 5' – 6' at the time of testing.

◊ Interpretation of Results

From the 1960's through the mid 1990's schools, colleges, and other facilities throughout the country installed synthetic "rubber-like" flooring in gymnasiums and similar rooms. Phenyl Mercuric acetate was utilized in these floors as a catalyst to level and spread the floor. These floors have a potential to off gas especially in places where seams, tears and cracks exist. Mercury is known to volatize at room temperatures above 77° Fahrenheit and therefore exposure may fluctuate based on temperatures within the space. Ventilation is an important key in maintaining a low level of vapor exposure. At the time of testing the HVAC system was on. Changes in room temperature, HVAC limitations or problems, or other climate changes should be considered and re-testing conducted if problems persist. Currently the Agency for Toxic Substances Disease Registry (ASTDR) has a residential occupancy level for Hg at 1 ug/m^3 or 1000 nanograms/m^3(1,000 ng/m^3). The Minnesota Department of Health is one of the few agencies in the country that sets vapor exposure guidance for Mercury Catalyzed Polyurethane Flooring at the present time. It sets a chronic level at 750 ng/m^3 and an acute level of 1800 ng/m^3. These guidance values set by the Minnesota Department of Health were based on the USEPA Integrated Risk Information System (IRIS) Reference Concentration (RfC) for chronic mercury exposure of 300 ng/m^3 (USEPA 2004), which is a lifetime exposure concentration not expected to result in adverse health effects to most people, including sensitive subpopulations.

At this point, Minnesota is the only state to date that has issued recommendations concerning rubber flooring in gym/multipurpose room flooring. The Minnesota Department of Health recommends the general public not be exposed to short-term mercury air concentrations above 0.0018 milligrams per cubic meter (mg/m^3) in schools. For longer term exposures, the Minnesota Department of Health recommends that gym teachers should not be exposed to more than an average of 0.00075 mg/m3 during a 40 hour work week and children be limited to an average of 0.00075 mg/m3 during 16 hours or less per week averaged over the school year.

The Occupational Safety & Health Administration (OSHA) and the New Jersey Public Employee Occupational Safety & Health (PEOSH) permissible exposure limit for airborne exposure to workers is an 8 hour time weighted average of 0.0100 milligrams per cubic meter for a 40 hour work week. The results of the samples collected were all less than the exposure limit established. However, the threshold of 0.0030 mg/m3 was slightly exceeded. The US Center for Disease Control (CDC) Agency recommends that entry into areas of schools where mercury levels exceed 0.0100 mg/m3 be restricted until airborne levels return to less than 0.0030 mg/m3. Since the results of testing do indicate levels were exceeded, periodic testing should be performed and increase air exchanges should be employed.

Section 3 Recommendations

Based on our assessment of the area, it appears that the levels detected by the LUMEX RA-915M are well above the levels established by USEPA / Minnesota Department of Health. Additionally, the levels exceeded the adjusted level developed by the Minnesota Department of Health as the adjusted value of 750 ng/m^3. As stated in the Interpretation of Results, levels may increase / decrease based on climate factors such as HVAC system limitations / issues, temperature changes, ventilation restrictions, and other climate changes.

It is suggested that if there are rooftop exhaust units these should remain on either continuously or at least two hours prior to occupancy to assist in decreasing vapor concentrations. Follow up ambient sampling should be conducted to verify that exhaust fans can provide enough air changes in order to lower vapor concentrations. In the interim, occupancy of the gymnasium should be limited to brief access until additional testing can confirm that increased ventilation has sufficiently lowered the number to permanently occupy the space. If no rooftop exhaust units exist then installation of these types of units should be considered. The doorways leading to the hallway should be utilized to increase fresh airflow into the gymnasium. Ventilation should be at the maximum amount feasible.

Ultimately, removal of the flooring is the best solution to decrease the level of mercury exposure from the floor. AHERA recommends keeping heat low, as needed, during winter months. Periodic air testing for mercury vapors should be done in the gymnasium and surrounding areas to ensure maximum ventilation of the space is continuously happening.

Additional bulk sampling/core sampling should be conducted on the flooring and its substrate to determine the extent of cross contamination.

OHIO Lumex Co. Certificate of Calibration

(Lumex Calibration Attached – 2 Pages)