

September 2, 2016

MB3-99-RLP-#331  
Mr. Jeff Fritz, Superintendent  
Clay Community Schools  
1013 S. Forest Ave.  
Brazil, IN 47834

Dear Mr. Fritz:

The purpose of this letter is to report the result of our indoor air quality evaluation at East Side Elementary School on August 22, 2016. This evaluation was conducted at Mr. Howard's request to address the health concerns of the occupants that may be related to indoor air quality of the school.

The Indiana State Department of Health's Microbiological Laboratory incubated and counted the fungal and bacterial units. The total colony forming units per cubic meter of air (CFU/M<sup>3</sup>) were computed by adding the fungal and bacterial counts, and dividing the sum by the total volume of the sampled air. Please refer to Table 1 for further details.

Our laboratory reported that the fungal colonies on the petri dish samples taken in classroom A-108 and A-118 were overgrown with a fungus. The fungal counts in the other classrooms sampled were lower than the outdoors. There are no limits established as an acceptable concentration of fungal counts indoors. There are guidelines that recommend fewer counts indoors than outdoors.

The Carbon dioxide (CO<sub>2</sub>) level was measured inside the classrooms. The highest carbon dioxide level measured was 1992 parts CO<sub>2</sub> per million parts of air (ppm). The School Indoor Air Quality rule, 410 IAC 33-4-2 states "carbon dioxide concentrations in the breathing zone shall never exceed 700 ppm over the outdoor concentration", in this case giving a limit of 1079 ppm. ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) recommends 15 cfm (cubic feet per minute) of outdoor air per person for classrooms.

The outdoor relative humidity was measured at 50 percent (%). The indoor relative humidity had a range of 60% and 69%. The American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) recommend the relative humidity in habitable spaces preferably should be maintained between 30% and 60% to minimize growth of allergenic and pathogenic organisms. Humidity levels above 50% have been found to increase the population size of molds, fungi and mites that may cause allergies. The evidence suggests that humidity levels should be maintained between 40% and 50% to reduce the incidence of upper respiratory infections and to minimize the adverse effect on people suffering from asthma or allergies. Such a range would be hard to maintain, however, exposure to higher or lower levels are unlikely to affect the health of most people.

Based on sample results and our visual inspection we note the following:

- 1) **410 IAC 33-4-2 (b): states “carbon dioxide concentrations in the breathing zone shall never exceed 700 ppm over the outdoor concentration”.** Classrooms A-108, A-116, A-118, and A-120 all exceeded the carbon dioxide concentration limit of 1079 ppm. Please ensure there is a sufficient amount of outdoor air being supplied into the classrooms.
- 2) **410 IAC 33-4-6 (d) states “when mold or mold-contaminated material is discovered, corrective action shall be taken within forty-eight (48) hours. Mold is not to be growing in the school”.** The samples collected in classrooms A-108 and A-118 were over grown with a fungus and could not be counted. Classroom A-118 had visible mold on items and materials attached to the chalkboard. The most likely source is the high humidity inside the classrooms, but a visual inspection should be conducted above the drop ceiling for drips and to identify any water damage or visible mold growth. We recommend inspecting the ceiling tile, carpet, and the unit vent drain pans and coils for hidden mold growth. Any remediation activity should be done after hours when students are not present. Air scrubber units with (HEPA) filtration and dehumidifiers should be considered until mold remediation has been completed inside the classrooms.
- 3) **410 IAC 33-4-4 Sec. 4 (b) states: “where provided air-conditioning systems shall be capable of providing and shall be operated to maintain a temperature not to exceed seventy-eight (78) degrees Fahrenheit and sixty-five percent (65%) relative humidity during periods of student’s occupancy”.** With the exception to the computer lab, the relative humidity levels inside the classrooms had a range between 65% and 69%. As shown in table 1, the relative humidity was above the allowed limit. The HVAC system should be checked to ensure it is operating within specifications. Humidity at the levels measured can promote mold growth.

Individuals experiencing any health problems should seek medical advice from a physician.

Please respond within 60 days of any actions you take based upon this report.

The School Indoor Air Quality rule 410 IAC 33-6-2 requires this report, and your response to this report, to be posted for 14 days at the location of the school building stated in the report so they are accessible to all students, parents, and employees.

If you have questions, please contact me at 317/351-7190 ext. 264

Sincerely,

A handwritten signature in blue ink that reads "Rick Plew". The signature is written in a cursive style with a small dot above the "i" in "Plew".

RICK PLEW  
Industrial Hygienist  
Indoor Air Section, Environmental Public Health Division  
Enclosure

**TABLE 1**  
**East Side Elementary School**  
**936 E. National Avenue**  
**Brazil, IN 47834**

**Computed Microbiological Air Sample Results**  
**Taken August 22, 2016**

SAMPLE ID	LOCATION	NO. OF OCCUPANTS	RELATIVE HUMIDITY (%)	CARBON DIOXIDE (ppm)	AIR SAMPLED (liters)	FUNGAL COUNT (CFU/M <sup>3</sup> )	BACTERIAL COUNT (CFU/M <sup>3</sup> )	TOTAL COUNT (CFU/M <sup>3</sup> )
1	Rm. A-108	23	65	1992	50	*	-	-
2	Rm. B-132	2	65	529	50	80	0	80
3	Computer Lab	18	60	867	50	140	0	140
4	Rm. A-120	16	69	1555	50	100	20	120
5	Rm. A-116	-	69	1447	50	240	0	240
6	Rm. A-118	22	69	1640	50	*	-	-
7	Outdoor	-	50	379	50	520	40	560

Notes: \* plate overgrown with fungus

% -----percent

Ppm-----parts per million

CFU/M<sup>3</sup>—colony forming units per cubic meter of air