

October 19, 2017

MB3-99-RLP-#389
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 Meridian Elementary School on October 10, 2017. 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/M³) 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.

Both fungal and bacterial counts outdoors were higher than any areas inside the building. 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 (CO₂) levels inside were measured with the highest reading of 2591 parts CO₂ 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 1152 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 91 percent (%). The indoor relative humidity had a range between 63% and 81%. 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. High humidity levels 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 deficiencies:

- 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 103, 104 and 105 exceeded the carbon dioxide concentration limit of 1152 ppm. Classroom 105 had the highest CO₂ concentration at 2591 ppm. The damper should be inspected to determine if it is functioning properly. Please take the necessary steps to ensure that sufficient outdoor air is being supplied into the classroom.

- 1) **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”.** As shown in Table 1, relative humidity in the classrooms exceeded the allowed limit. Humidity at the levels measured can promote mold growth. The outdoor relative humidity was 91% and likely impacted the humidity levels inside the classrooms. We encourage the school to take the necessary steps in lowering the humidity levels when they exceed 65%. Please ensure the HVAC system is operating within its specifications.

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.

Individuals experiencing any health problems should seek medical advice from a physician. If you have questions, please contact me at 317/351-7190 ext. 264

Sincerely,



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

TABLE 1
Meridian Elementary School
 410 N. Meridian Street
 Brazil, IN

Computed Microbiological Air Sample Results
 Taken October 10, 2017

SAMPLE ID	LOCATION	NO. OF OCCUPANTS	RELATIVE HUMIDITY (%)	CARBON DIOXIDE (ppm)	AIR SAMPLED (liters)	FUNGAL COUNT (CFU/M ³)	BACTERIAL COUNT (CFU/M ³)	TOTAL COUNT (CFU/M ³)
8	Front office	6	63	808	50	100	20	120
9	Rm. 215	3	77	612	50	180	40	220
10	Rm. 103	20	66	1427	50	40	0	40
11	Rm. 102	22	81	813	50	540	200	740
12	Rm. 104	20	70	1361	50	300	180	480
13	Rm. 105	25	67	2591	50	460	40	500
14	Outdoor	-	91	452	50	2620	840	3460

Notes:

% -----percent

Ppm-----parts per million

CFU/M³—colony forming units per cubic meter of air