



Eric J. Holcomb
Governor

Lindsay M. Weaver, MD, FACEP
State Health Commissioner

August 28, 2023

MB3 99 RLP #541

Dr. Christopher A. Himself, Superintendent
Vigo County School Corporation
P.O. Box 3703
Terre Haute, IN 47803

Dear Dr. Himself:

The purpose of this letter is to report the result of our indoor air quality evaluation of South Vigo High School on August 22nd. This evaluation was conducted at the request of a concerned citizen to address concerns about the air quality in the school.

The Indiana State Department of Health's Microbiological Laboratory incubated and counted the fungal and bacterial units. The colony forming units per cubic meter of air (CFU/M³) were computed taking the fungal or bacterial counts and dividing by the total volume of the sampled air. Please refer to Table 1 for further details. The lab reported that fungal concentrations in the areas sampled indoors were lower than the outdoor concentration. 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 2084 parts CO₂ per million parts of air (ppm). The School Indoor Air Quality rule, 410 IAC 33-4-2 states "(a) 'Outdoor Air shall be supplied to classrooms when occupied. (b) Carbon dioxide concentrations in the breathing zone shall never exceed 700 ppm over the outdoor concentration', in this case giving a limit of 1101 ppm. ASHRAE (American

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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 76 percent (%) and the indoor relative humidity had a range of 60% to 79%. The American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) recommends 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.

Our sample results do not indicate an issue with mold in the building. However, the following deficiencies were noted during the inspection.

- 1) **410 IAC 33-4-2 states “carbon dioxide concentrations in the breathing zone shall never exceed 700 ppm over the outdoor concentration”;** Classrooms 120, 127, 155, 162, 312, and 405 were above the suggested limit of 1101 ppm and in violation of this section. The highest carbon dioxide concentration was measured in classroom 405 at 2084 ppm. Please inspect the HVAC system and make repairs if needed. Ensure there is an adequate amount of fresh air being brought into the classrooms during occupancy. Although this is an older building with limitations, we suggest the school look into updating their HVAC system when it is feasible to ensure they are meeting the requirements of the 410 IAC 33-4-2 rule.
- 2) **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 classrooms 127, 213, and 312, relative humidity levels inside the classrooms were above 65%. Relative humidity at the levels measured can promote mold and bacteria growth in classrooms and therefore should be



closely monitored. We understand it can be difficult at times maintaining a balance between temperature, relative humidity and the amount of fresh air being brought into the building, especially during hot/humid outdoor conditions. However, we urge the school to take the necessary steps in lowering the humidity levels when they exceed 65% and ensure the HVAC system is operating within its specifications.

- 3) **410 IAC 33-1 requires schools to designate an individual as their Indoor Air Coordinator and states "The IAQ Coordinator's contact information shall also be published: 1) on the school website and 2) in the school handbook"**
The school needs to designate an Indoor Air Coordinator and have their contact information on the school's website and in the student handbook.
- 4) **410 IAC 33 requires schools to have written policies for Vehicle Idling, Animals in Classrooms, and Chemical Management.** The school needs to have these policies in place.
- 5) **410 IAC 33-5 a) states "Schools shall establish and maintain a written procedure for routine maintenance of HVAC systems.** This procedure shall include but is not limited to the following items: 1) A schedule for inspecting the HVAC system including an annual inspection 2) Ensuring that all supply and return air pathways in the ventilation system are unobstructed and perform as required 3) A schedule for cleaning the HVAC coils annually at a minimum 4) A schedule for inspecting and changing filters. 410 IAC 33-5 b) states "Schools shall establish and maintain written maintenance logs covering cleaning and filter changes of the HVAC systems for a minimum of three (3) years.
- 6) There was a stained ceiling tile in Classroom 162. Please conduct a thorough inspection above the drop ceiling for leaks. We suggest you remove and replace any stained tile.

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 a conspicuous location inside the school building so they are accessible to all students, parents, and employees. Please respond within 60 days of any actions you take based upon this report.



If you need assistance in developing the required policies or meeting any requirements of the School Indoor Air Quality rule, the rule and Best Practices documents with example policies are available on the Indiana Dept. of Health's (IDOH) Indoor Air website. If I can be of any assistance, feel free to contact me at 317/682-9030

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

Sincerely,

A handwritten signature in black ink that reads "Rick Plew".

RICK PLEW

Industrial Hygienist

Indoor Air Section, Environmental Public Health Division

Enclosure



TABLE 1

South Vigo High School
3737 S. 7th Street
Terre Haute, IN 47802

Computed Microbiological Air Sample Results
Taken August 22, 2023

SAMPLE ID	LOCATION	NO. OF OCCUPANTS	RELATIVE HUMIDITY (%)	CARBON DIOXIDE (ppm)	AIR SAMPLED (liters)	FUNGAL COUNT (CFU/M ³)	BACTERIAL COUNT (CFU/M ³)
1	Room 100	8	66	549	50	20	0
2	Room 158	18	71	1107	50	120	60
3	Room 162	16	73	1394	50	20	0
4	Room 167	14	79	852	50	80	20
5	Room 155	15	68	1367	50	80	0
6	Room 127	13	64	1321	50	160	160
7	Room 120	15	67	1360	50	60	100
8	Library	17	68	558	50	20	60
9	Room 312	15	63	1569	50	20	40
10	Room 213	19	60	909	50	20	20
11	Room 405	24	79	2084	50	0	0
12	Outdoor	-	76	401	50	1480	100

Notes:

% -----percent

ppm-----parts per million

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