

Illinois Department of
**Public
Health**

John R. Lumpkin, M.D., M.P.H., Director

4302 North Main Street • Rockford, Illinois 61103-1209

May 9, 1997

103139701
Case# 10197001

Mr. Art Commare
Belvidere School Administrative Office
1201 5th Ave
Belvidere, IL 61008



Dear Mr. Commare:

The analysis of the indoor air samples for molds and bacteria collected from Lincoln School (March 13, 1997) have been completed. The mold samples were collected using an Andersen Sampler. Three sets of plates were used for each sample; malt extract agar for fungi, cellulose agar for cellulose digesting fungi (e.g. *Stachybotrys* and *Trichoderma*) and soy-casein media for bacteria. These plates were analyzed by Luke Curtis, MS, IHIT at the University of Illinois at Chicago. The results of the mold and bacteria samples are listed in table 1.

None of the bacteria or fungi counts were particularly high (Note that the average indoor counts are comparable with the outdoor counts). Yeasts appear to comprise a high percentage of the fungi samples. Common fungi from the genera *Penicillium*, *Aspergillus*, *Cladosporium* and *Trichoderma* are also present in many samples. No *Stachybotrys* was detected in any of the cellulose samples. There are no indoor air standards for total counts of fungi and bacteria. However, some researchers have suggested a standard of 1,000 to 5,000 colony forming units per cubic meter of air (CFU/M³).

The analysis of the dust samples for allergens collected from Lincoln School (April 2, 1997) have also been completed. The dust samples were collected from the air filters in the gym and the library. These samples were also analyzed by Luke Curtis and are listed in table 2.


The dust mite and cockroach allergen concentrations are below levels reported to cause human health effects. The cat allergen concentrations are at a level that may affect sensitive individuals. Studies have indicated that cat allergens can be tracked into school buildings on student and school personnel clothes. Again, there are no indoor air standards for allergens.

To date, we have measured carbon dioxide, temperature, humidity, mold, bacteria and allergen levels. Pesticide sampling was not considered since the building has not been treated for several years. Based on visual inspection and sample results, our recommendations concerning the indoor air quality of the school are as follows;

- 1) The ventilation duct work should be thoroughly cleaned. This work should be conducted when the building is not occupied.
- 2) The ventilation equipment should be properly maintained and the air filters should be changed or cleaned on a regular basis.
- 3) The attic area should be thoroughly cleaned of all bird and bat droppings. Again this work should be done when the building is not occupied. Care must also be taken not to contaminant the rest of the building when doing this work. Proper personal protective equipment must be used when doing this work (e.g. respirators and disposable clothing).
- 4) The carbon dioxide levels measured earlier this year were slightly high. We would recommend that you provide additional fresh air and maintain carbon dioxide levels at less than 1,000 parts per million. However, we realize that the heating and ventilation system is old and during periods of cold weather it may not be possible to provide additional fresh air without affecting the building temperature.
- 5) The cat allergens identified in the dust samples will be difficult to deal with. We would recommend frequent cleaning, and cleaning methods that do not generate a lot of airborne dusts (e.g. damp dusting or mopping).

If you have any questions or we can be of any further service, please feel free to contact our Rockford Regional Office located at 4302 North Main Street, Rockford Illinois, 61103, telephone 815/987-7511.

Sincerely,



Roger J. Ruden, P.E.
Regional Engineer

SJ:sj

cc - Central Office
- Rockford Regional Office
- Boone County Health Dept.

enc.

Table 1:

Bioaerosol Sampling at Lincoln School, Belvidere Illinois
March 13, 1997

SAMPLE NUMBER AND LOCATION	MALT EXTRACT PLATES FUNGI (IN CFU/M ³)	CELLULOSE PLATES CELLULOSE DIGESTING FUNGI (IN CFU/M ³)	BACTERIA PLATES GRAM POSITIVE & NEGATIVE BACTERIA LISTED (IN CFU/M ³)
L-1 Outside Air Sample (north side of building, very windy and blowing)	216- Total Fungi 72- Fusarium species 54- Yeasts 54- Cladosporium herbareum 36- Penicillium brevicompactum	216- Total Fungi 72- Cladosporium cladosporoides 54- Trichoderma 36- Penicillium glabrum 18- Penicillium brevicompactum 18- Unknown 18- Yeast	90- Total Bacteria all 90 Gram +
L-2 Room #3 (middle of room, not occupied)	234- Total Fungi 90- Yeasts 72- Cladosporium herbareum 72- Penicillium brevicompactum	144- Total Fungi 54- Penicillium glabrum 54- Penicillium brevicompactum 18- Aspergillus versicolor 18- Trichoderma	306- Total Bacteria 36- Gram + 270- Gram -
L-3 Room #3 (over heat vent on window side)	180- Total Fungi 90- Penicillium brevicompactum 18- Penicillium glabrum 54- Yeasts 18- Cladosporium herbareum	144- Total Fungi 90- Eurotium Aspergillus Glaucus 36- Yeast 18- Penicillium brevicompactum	172- Total Bacteria 18- Gram + 154- Gram-
L-4 Kindergarten Room (middle of room, occupied)	216- Total Fungi 72- Yeast 54- Penicillium brevicompactum 36- Cladosporium herbareum 18- Eurotium Aspergillus Glaucus 18- Trichoderma 18- Unknown	288- Total Fungi 180- Eurotium Aspergillus Glaucus 54- Penicillium brevicompactum 36- Emericella Aspergillus nidulans 18- Penicillium glabrum	324- Total Bacteria 54- Gram + 270- Gram -
L-5 Library Room (nw corner of room, occupied)	288- Total Fungi 180- Yeasts 54- Moniella 54- Penicillium brevicompactum	234- Total Fungi 144- Yeasts 54- Trichoderma 36- Aspergillus penicilloides	648- Total Bacteria 210- Gram + 438- Gram -
L-6 Room #11 (front of room, occupied)	162- Total Fungi 126- Yeasts 36- Cladosporium herbareum	216- Total Fungi 144- Yeasts 36- Unknown 18- Penicillium brevicompactum 18- Moniella	504- Total Bacteria 168- Gram + 336- Gram -
L-7 Room # 9 (back middle of room, not occupied)	234- Total Fungi 180- Neurospora- overrun 36- Cladosporium herbareum 18- Yeast (This plate overrun with Neurospora or common bread mold- count may not be very accurate in this case)	288- Total Fungi 216- Yeasts 72- Scopulariopsis	144- Total Bacteria 36- Gram + 108- Gram -

SAMPLE NUMBER AND LOCATION	MALT EXTRACT PLATES FUNGI (IN CFU/M ³)	CELLULOSE PLATES CELLULOSE DIGESTING FUNGI (IN CFU/M ³)	BACTERIA PLATES GRAM POSITIVE & NEGATIVE BACTERIA LISTED (IN CFU/M ³)
L-8 Room #15 (front of room, not occupied)	90- Total Fungi 72- Cladosporium herbareum 18- Yeast	108- Total Fungi 72- Scopulariopsis 18- Cladosporium herbareum 18- Yeasts	108- Total Bacteria 36- Gram + 72- Gram -
L-9 Resource Room (middle of room, not occupied; below grade)	36- Total Fungi 36- Yeast	162- Total Fungi 72- Scopulariopsis 36- Yeasts 18- Aspergillus penicilloides 18- Aspergillus versicolor 18- Unknown	108- Total Bacteria 18- Gram + 90- Gram -
L-10 Art/Music Room (middle of room, not occupied; below grade)	108- Total Fungi 54- Yeasts 18- Penicillium glabrum 18- Trichoderma 18- Verticillium	252- Total Fungi 180- Yeasts 72- Trichoderma	342- Total Bacteria 90- Gram + 252- Gram -
L-11 Furnace-Return Air Plenum (large walk in plenum, water on floor)	216- Total Fungi 198- Yeasts 18- Cladosporium herbareum	126- Total Fungi 72- Yeasts 36- Trichoderma 18- Emericella Aspergillus nidulans	288- Total Bacteria 72- Gram + 216- Gram -
L-12 Gym Stage (gym occupied)	468- Total Fungi 243- Yeasts 94- Penicillium brevicompactum 94- Cladosporium herbareum 37- Unknown	252- Total Fungi 126- Yeasts 90- Trichoderma 36- Cladosporium herbareum	774- Total Bacteria 378- Gram + 396- Gram -
L-13 Attic (middle area, pigeon and bat droppings)	180- Total Fungi 180- Yeast	342- Total Fungi 270- Yeasts 36- Cladosporium herbareum 18- Trichoderma 18- Scopulariopsis	180- Total Bacteria 108- Gram + 72- Gram -
L-14 Attic (inside return air at top of stairs)	144- Total Fungi 54- Cladosporium herbareum 54- Yeast 18- Fusarium 18- Unknown	342- Total Fungi 288- Yeasts 36- Cladosporium herbareum 18- Unknown	216- Total Bacteria 36- Gram + 180- Gram -
Total Indoor Average	197- Average total fungi indoors	223- Average cellulose fungi indoors	316- Average total bacteria indoors
Outdoor Level	216- Total fungi	216- Total fungi	90- Total bacteria

Sample Rate = 1 cubic foot per minute
Sample Time = 2 minutes
CFU/M³ = Colony forming units per cubic meter of air

Table 2:

Dust Allergen Test Results at Lincoln School, Belvidere Illinois
 April 2, 1997

Location	Allergens (by Enzyme Linked Immuno Sorbent Assay, ELISA)			
	D. farinae allergen * (ppm)	D. pteronyssinus allergen * (ppm)	Cat allergen (ppm)	Cockroach allergen (units per gram)
Gym	-0.01	* -0.03	13.7	1
Library	0.02	0.15	38.5	0

Note - allergen levels may be slightly negative due to sample variation in ELISA

ppm - parts per million

* - Dust mite allergens