

Environmental Assessment
From an
Indoor Air Quality (IAQ)
Perspective

At
3 Valley Road
New Idaho NJ 94T18

Performed for:
Mr. and Mrs. Bird

Work performed on premises
Last week

By
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Executive Summary

The Birds had their home listed for sale. A customary home inspection identified the possibility of mold due to roof paneling showing “discoloration”, and suggested a Mold survey. The subsequent mold survey identified “trouble” areas, and “strongly” recommended “remediation”. The present document is an evaluation of the aforementioned documents, complemented with a site visit, which did not identify any trouble area, did not warrant any remediation, noted the structure as healthy and sound, and will justify these latter conclusions with the following paragraphs.

Findings

The Bird home uses conventional stick-frame construction with conventional fittings, sheetrock, T1-11 paneling covering the exterior, etc. There are some area rugs. The upper story rooms have ceilings slanted to follow the roof pitch. They own a HEPA vacuum cleaner. The home has baseboard heating, but no central air conditioning. The home is set in a wooded surrounding. Its basement (*with openings on grade to outdoors*) is conditioned and outfitted as living space. They use a Dehumidifier in summertime in the basement to better control relative humidity. It was raining at the time of the site visit.

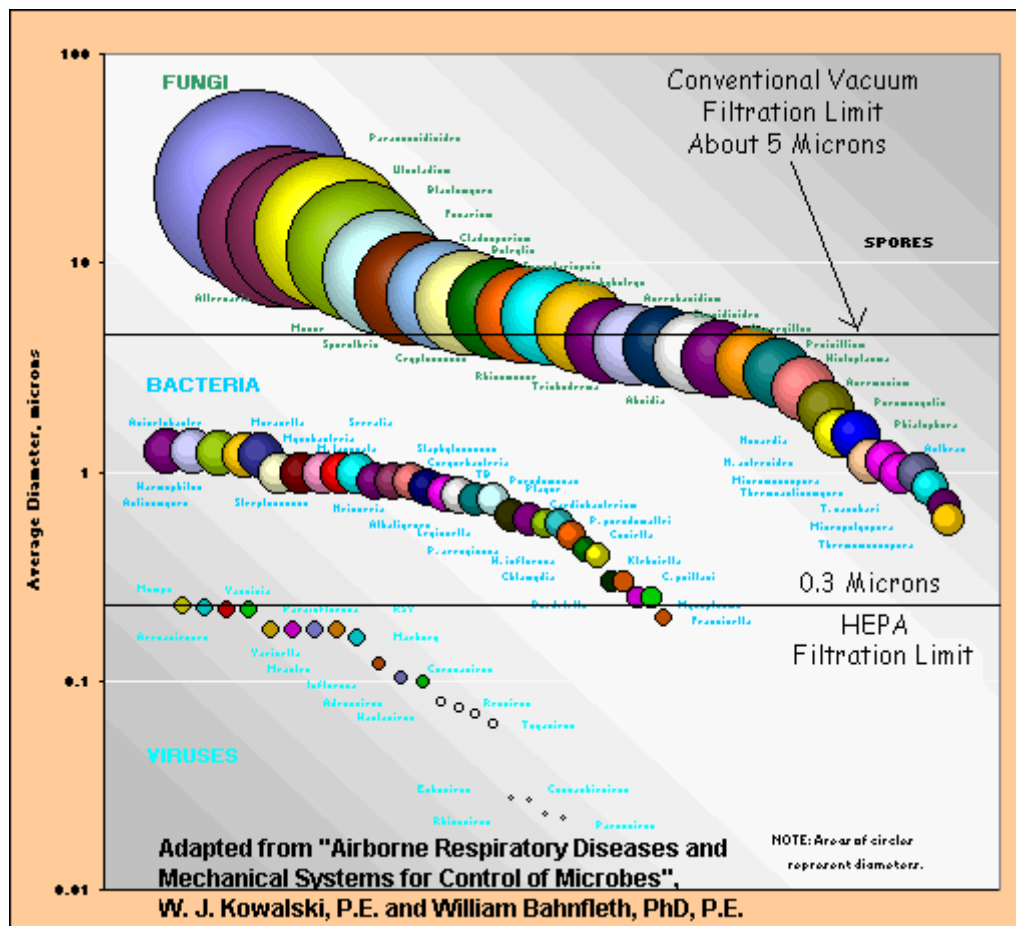
Discussion and Recommendations

The author used a Moisture meter to determine the airborne Relative Humidity (**RH**), and another moisture meter to determine the Wood Moisture Content (**WMC**).

Molds generally thrive in environments more moist than about 65% RH. Some genera thrive at very low RH of less than about 35%. During the entirety of the visit, the airborne RH was at about 50 to 52%. **The airborne moisture content found is Not sufficient to support any mold growth.**

Wood reaches equilibrium dry conditions at about 10 to 12% WMC. All structural lumber from the basement to the attic tested at 9 to 12% WMC, except the roof paneling which tested at about 14%. The opposite side of the paneling (*the outdoors, beyond the tar paper and shingles*) was wet due to rain. The roof beams tested between 9 to 12% WMC, despite various degrees of discoloration. A test of wall structures adjacent to all windows and of the slanted roofs in the upper story rooms identified an equilibrium dry condition. **The structural WMC found is Not sufficient to support any mold growth.**

The Birds have and use, a High Efficiency Particulate Air (**HEPA**) vacuum cleaner.



Note from the above that a HEPA vacuum has a very efficient capture level down to 0.3 microns, which includes all pollen, all mold, most bacteria, and inanimate particulates larger than 0.3 microns. Even occasional use of such a vacuum will eliminate the possibility of dust buildup (*as within carpeting*) that could potentially foster mold growth, regardless of the fact that the RH would have to be elevated high enough to support growth, as **molds need a food reservoir – lots of moisture – and relative darkness (sunlight reduces their life expectancy due to the UV)**. **These conditions not existing indicates that any detected mold were simply a reflection of mold exchanged with outdoors in the process of opening the door to come in or go out, or open windows.**

Another confounding factor to consider is that the “attic” mold concentration was justifiably quite high, and during the time of this author’s visit last week, there was a most noticeable breeze flowing through the attic and into the living space while the hatchway was open. If this continued for more than a few seconds (*a certainty*), any

subsequent air sampling indoors would have been compromised or heavily biased toward a “moldy” finding, especially since this was the very first location to be sampled.

Considering that the area surrounding the home is wooded, with lots of leaves on the ground, supports the fact of substantial outdoor mold characteristic of that surrounding. The home should be expected to consistently display concentrations lower than outdoors at all times, only if outfitted with a central air conditioner. The home is not so equipped. Nonetheless, **however, all indoor concentrations depicted airborne levels lower than the maximum outdoor level** (also note that the outdoor level changes with time of day, a characteristic that would be matched indoors if windows were open) due to isolation / sheltering from outdoors for human comfort. So if one naively assumes that the home is moldy, then the surrounding outdoors is deadly . . .

Area	“Attic”	Outside	Garage	Office	1FL LR	Outside	2FL Kitchen	2FL LR	2FL Br #1	2FL Br #2
Genus										
Alternaria	460		92		184	92				
Ascospores	644	184				460				
Asp / Pen	>5000	828	1012	460	1288		184	644	460	736
Basidio-spores	920	368	184	276		920	92	184	276	368
Clado-sporium	1564		276	92	368	552	92	368	184	644
Epicoccum	92									
Hyphae	1012	276	276	184	460	184		276	92	276
Peric					92	184				
Pithomyces	368		92		184	276				
Pollen		184				368				
Total	>10,060	1840	1932	1012	2576	3312	368	1472	1012	2024
Moldy ?	Yes	NA ?	Yes	No	Yes	NA ?	No	Yes	No	Yes

*Mold concentrations as chronologically found several weeks ago with **incorrect** conclusions*

The “attic” is nothing more than a very narrow passage, and the short horizontal ceiling below it perhaps a cosmetic treatment to complement sloped ceilings found in other upper story rooms. If a human was laying down within the “attic,” he / she could not turn around, as the space is no more than about two feet wide at its base and about one and one half feet high at its highest. **The “attic” space is thus not used for storage, nor access due to its very confining limitations, is thus Not “living space” as stated in the former mold survey, and should be considered “outdoor” space.**

The reason the “attic” is so rich in mold spores, is that it normally does not get vacuumed . . . it probably never was (as with most other attics). It is outfitted with loose fiberglass insulation. This matrix is ideal for storing dust that may settle as it is passing through the space. The air space is open to outdoors via two gable vents, and during this author’s visit there was a tangible breeze within the narrow passage. The author had to

perform quite a bit of twisting and turning to get the hatchway cover to come out of its housing, not because it was tight, but because moving it up was immediately met with interference from the roof beams. The hatchway cover is loosely covered with the same loose fiberglass insulation. **Considering the difficulty encountered by the author, and similar efforts expended by the previous mold surveyor, the mechanical agitation received by the fiberglass in the process of access is equivalent to beating it with a tennis racquet. That would cause the thirty years or so of accumulated dust and dormant mold spores to become airborne, causing the skewed and incorrect conclusions of the previous mold “inspector.”**

The discoloration of the roofing plywood, appears to be a normal consequence of aging, as no mold growth could be noted on its surface, nor on the surfaces of the roof beams that were holding it in place. The roofing shingles were replaced about two years ago. Unless the roof plywood was changed at that time due to degradation, the contents of the “attic” would have remained undisturbed since initial construction. Mr. Bird indicated not replacing any plywood during re-roofing.

Resources:

Airborne Respiratory Diseases and Mechanical Systems for Control of Microbes,
W. J. Kowalski, P.E. July 1998, Heating / Piping / Air Conditioning magazine - 1998
(http://www.engr.psu.edu/ae/iec/abe/publications/airborne_resp_disease_control_microbes.pdf)