



To: Re: Mold and moisture in the attic

From: Marko E. Vovk  
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Date: 2-15-04 Cold Snow Cover / 19.2 F / 54.2 / Dew point 6.2  
Inspection time 4:30 PM – 6:00 PM

Dear XXXXXXXXXXX,

On the afternoon of 2/15/04, you employed Marko E. Vovk from Ambassador Construction Consultants Inc. to visually perform a non-destructive, partial, and visual inspection of the XXXXX Porter Rd. North Olmsted property. The following are the opinions of the inspection that transpired on 2/15/04.

Based on my education, training, and experience, there were several observations and conclusions made about the above referenced property.

Facts in issue:

- You moved into this dwelling in September 2003.
- Prior to your purchase, you had the home inspected.
- Your home inspector found mold and you wanted the mold to be cleaned up.
- The prior owners had the mold cleaned prior to your purchase.

- The winter water started to leak and you noticed that mold still existed in the attic location.

The following are field data from temperature, moisture, and humidity mapping:

## Moisture and humidity mapping results

The entire home was mapped for room temperature, room humidity, surface temperatures, and moisture content. Approximately 80 different readings were taken and documented on field notes. Only several of the 80 readings are documented on this diagnostics report. The sling psychrometer<sup>1</sup> was used for baseline testing results and the digital hygrometer<sup>2</sup> was used for the data collection. All surface moisture mapping was conducted using the Tramex moisture-testing gauge and an infrared laser. All values are represented in mathematical terms to determine the potential cause of fungal development.

## Nomenclature or abbreviations for all below field data

T=temperature Fahrenheit

ST= Surface temperature buy infrared surface laser thermo gauge

N=north wall, S=south wall, E=east wall, W=west wall, C=ceiling temperature,

F=floor temperature DP=dew point, I=inner wall (inner walls tend to be warmer)

EX=exterior exposed wall (exterior walls tend to be cooler)

M=mold on surface that is being tested for surface temperature

B=Basement 1=First Floor 2=Second Floor

Most equipment used for this evaluation is calibrated and with NIST Certifications. For numerical purposes and a mathematical analogy, we plotted the wet attic insulation temperatures in the attic above the bathroom to determine if the environment in the home was desirable for fungal amplification.

Location	Room T	Humidity	Dew Point	ST N	ST W	ST S	ST E	ST C	ST F	ST OTHER
Kitchen	74.9	21.6	33.4	63.8	74.2	68.6	66	72.8	63.2	
Living	73.9	21.4	32.1	69	71.8	79.6	71.6	72	68	
Laundry	71.7	21.8	32	64.6	60	76	71.4	69.2	56.6	
Dining	71.5	22.6	32.3	71.4	65.2	69	66.4	70.2	65.6	
BedSW				75.4	70.2	74.8	75.6	76.2	75	
BedSE				71.4	74.4	70.4	70.2	67.6	71/6	
BedNW	76.5	31	43.7	73	70.6	77	76			
BedNE	78.8	29.6	43.7	71	74.4	71.6	60.4	63.8	71.6	
Attic	55.7	38.9	31.5	33.2	34.8	34.8	31.6			28.2 corner
Exterior	19.2	54.2	6.2							

<sup>1</sup> This baseline test does not need calibration. All gauges used are first compare to the sling results. If equipment is within 3 %, it is used data gathering,

<sup>2</sup> VelociCalc with NIST Cert.

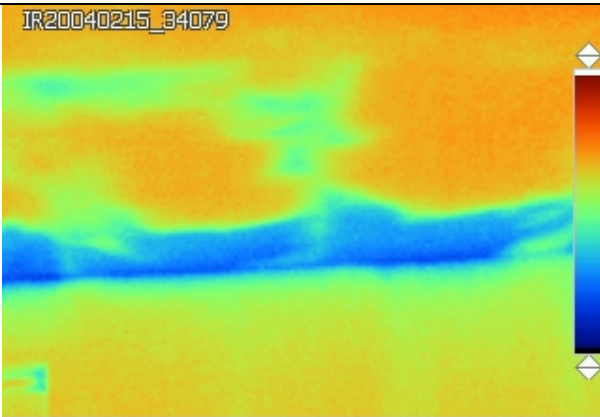
**Diagnostic evaluation of why the insulation was wet in the attic area and why fungal reservoirs existed at eaves.**



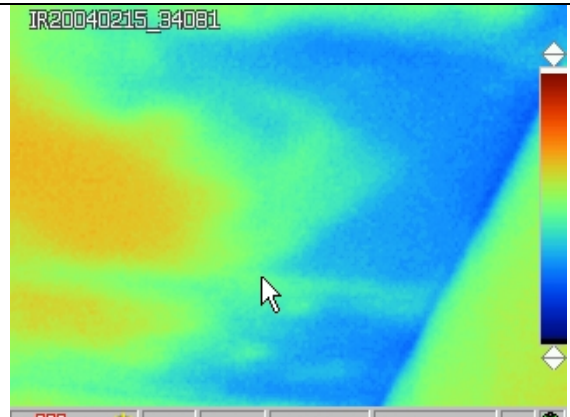
Ceiling has started to dry out on the second floor bedroom.



Loose ceiling section in the bedroom on the second floor.



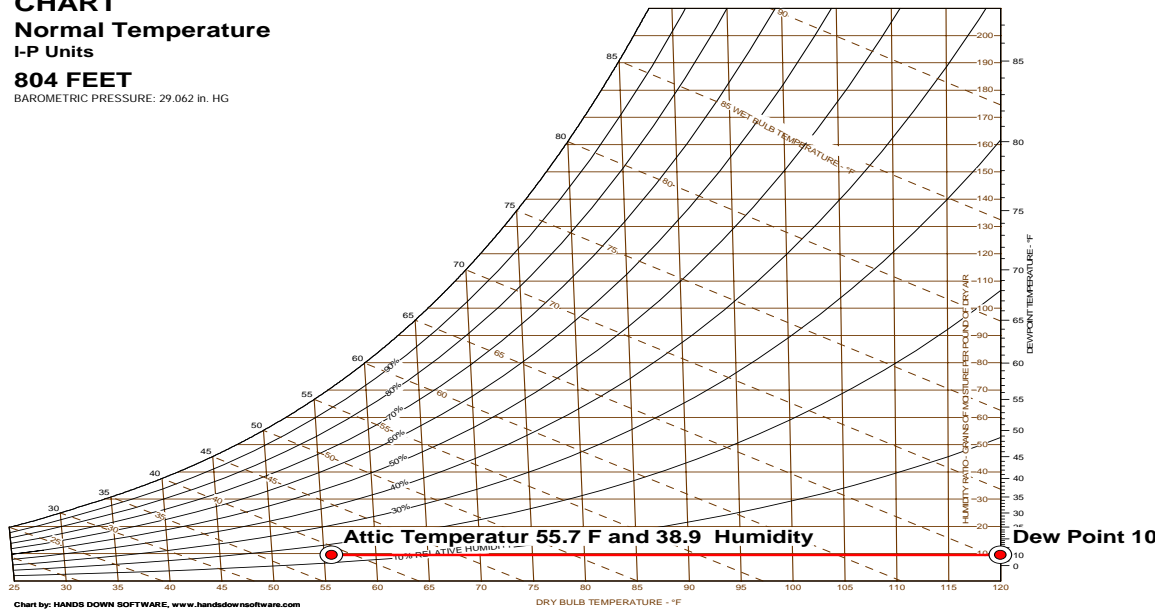
Second floor bedroom ceiling shows past leakage conditions. See the blue color.



Some moisture still exists in the soffit of the east second floor master bedroom. See the blue color.

## Attic condition at time of inspection

**PSYCHROMETRIC  
CHART**  
Normal Temperature  
I-P Units  
**804 FEET**  
BAROMETRIC PRESSURE: 29.062 in. HG



During the time of inspection, the dew point needed in the attic to cause condensation, would need to be 10 F or less. At the time of inspection, a dew point was not being reached. The prior weeks had colder temperatures and the dew point **may** have been reached. We were informed that this home also had ice dams. During the last melt, ice dam back up could have caused have this problem. The upper infrared images were taken at the same location that these supposed ice dams occurred. We were informed by the homeowner that this same location had insulation stuffed into the soffit area constricting lower ventilation needs. If insulation is stuffed in the soffit, the lower ventilation is constrained and could cause ice dams.

Below shown are the present conditions that exist within this dwelling!



It appears that the last roofer covered the top hats or roof vents. It appears that a ridge vent was added. The soffit was not checked and the insulation was not removed. Roofers who install ridge vents should make sure the



Some snow and ice still existed in the gutter on the east side. Ice dams were caused by heat loss in the attic and cold soffit. If the soffit were stuffed with

adequate soffit venting exists. We were informed by the homeowner that soffit ends had insulation.

insulation, the potential for ice damming would exist.



At the time of inspection, the insulation had been removed from the soffit area. Some fungal reservoirs exit at these areas. These

conditions appear to be areas that were not sealed during previous mold encapsulation work.



At the time of inspection, the house did not have temperatures that would allow dew points to occur. It is possible the

past cold weather would have allowed for condensation. If moisture accumulated in the attic, fungal reservoirs had the potential to amplify.



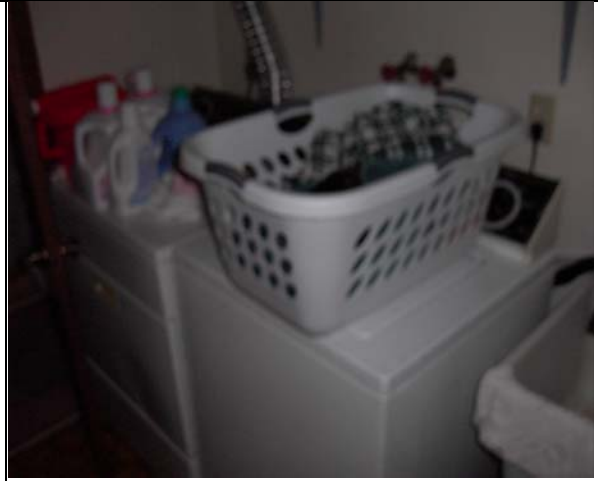
Metal windows are not optimal. They are generally cold and will condensate first. These window show signs of past condensation. At the time of inspection, house humidity levels were low and expectable.



The bathroom vent was sloppy. Bathroom vents should not be constructed. It is my professional opinion, that prior to the recent purchase; this attic had condensation conditions caused by high humidity and form poor soffit ventilation.



The second floor north bedroom had a humidifier. This apparatus could have easily contributed to augmented humidity levels in the attic.



The air volume is not significant in this home. Along with the home being tight, upper levels of indoor humidity could cause adverse conditions.



Pets, auto water feeders, plants, cooking, excessive dryer loads, boiling water, and more all contribute to indoor humidity. Although conditions were

considered normal, being cognizant and implement interim controls during cold climates should be done.



Adding more soffit ventilation would help diminish the formation of ice dams.

## Executive Summary

This home had moisture conditions that caused fungal reservoirs to amplify in the attic in past years. Past roofers removed roof vents and added ridge ventilation. Past roofers should have gone into the attic and repaired soffit ventilation. Past mold, abatement contractors encapsulated the attic and did not encapsulate hard to reach areas. Hard to reach areas would have included the soffit where supposed insulation was stuffed. The winter of 2004 was cold and interior household living conditions along with insulation stuffed in soffit caused ice dams and possible attic condensation. At this time, moisture has damaged the bedroom ceiling and saturated the insulation.

### DISCLAIMER

This inspection should be considered partial, time-limited, non-destructive, and strictly opinion oriented. We can at some future date, generate a more extensive report with other observed conditions from our field notes, digital photographs, and additional inspections. We can at some future date conduct a full building inspection of all building components such as attic, roof, plumbing, interiors, walls,

beams, headers, stairs, exterior, grounds, garage, stairs, heating, cooling, appliances, radon gas, mold, pest, or any other home inspection related field constituent. We cannot be held liable for misunderstanding or the omission of any item pertaining to the above said structure. We encourage that you obtain second opinions as we do all our clients for all our inspections. This report is not intended for third parties and is not transferable. Third parties should obtain their own reports from their own inspectors. This report is not intended to be: a design structural repair, a repair estimate, an environmental inspection, a load study, a determination of footing size or footing depth, a determination of possible future conditions, a determination of future slab settlement, a code inspection, a prediction additional cracking, a geotechnical soil investigation, and engineering calculation, a predication of settlement, a run-off study, and underground sewer exploration, sub-slab seepage exploration, a HVAC design, a bacterial or fungal investigation, a camera study, or any other technically exhaustive inspection that may require a more precise investigation. Furthermore, this inspection on you should obtain at least three bids per work type included the temperature and humidity levels of the home at the time of inspection. No microbial samples were taken. This is not an indoor air quantity report. We made assumptions from information provide by the client and by contractors.

If you have any questions pertaining to this matter, please feel free to contact me 431-TEST or 431-HOME.

Thank you,

### **Marko E. Vovk**

**Fee for the inspection and report was \$295 and was paid in full at the time of inspection.** Additional testing, reporting, non-destruction testing, thermo imaging, expert witness testimony, depositions will all require additional fees and to be paid prior to any scheduling. Expert witness and depositions are billed at ½-day rates of \$450. Only several images out 95 were used for this report. Images can be purchased for \$2 each and \$150 storage fee. The digital lots will not be split up and must be purchased in its entirety. This report is to be considered expert and not factual. Additional reports can be purchased for \$25 each. The images are the property of Marko E. Vovk and cannot be duplicated without his permission.  
Other services: estimate of damage report \$300, thermo imaging \$300, \mold testing depends on amount of testing.