

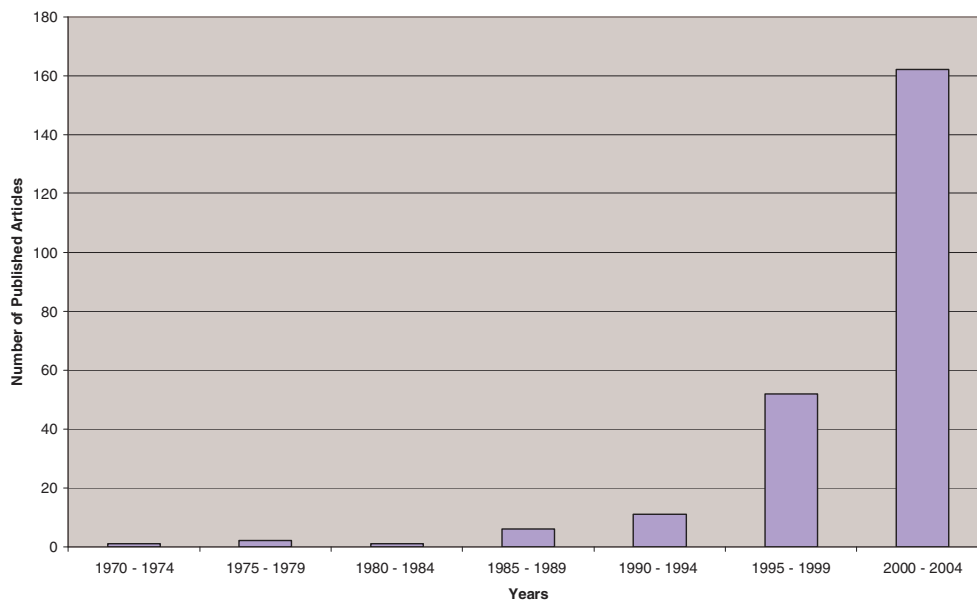
## **Mold Inspections—The Hurdles of the Site Professional**

**Jennifer Ellis, MPH, CHMM  
Director, Environmental Health and Safety—Real Estate  
Hillmann Environmental Group, LLC  
Union, New Jersey**

**Michael Holton, MS  
Associate  
ENVIRON International Corporation  
Princeton, New Jersey**

### **Introduction**

Mold and concerns about its effects on human health and indoor air quality have been commanding greater attention over the past few decades. A search of Pub Med for published literature using the search terms “mold”, “air quality” and “health” produced 330 relevant documents. The publication date of these documents strongly suggests a recent growth in the field. Prior to 1980 only three articles were found; nearly 50 articles were found in 2004 alone. Figure 1 displays the distribution of these articles over time. Although this growth presents great opportunity for industrial hygienists, along with it comes the potential for conflict. The growth in literature demonstrates not only increased interest, but also an ever changing scientific understanding. Guidelines and standards are constantly changing. A dynamic program of constant adjustment and continuing education is fundamental to the competent mold professional. This document is not meant to serve as the latest guidance on mold. This document is a commentary on the field experience of industrial hygienists and some of the conflicts and less than ideal situations they have faced. The document further discusses some of the practical solutions and general concepts that have been useful in our experience for making decisions in the absence of “perfect” information. This document will further develop these concepts through the discussion of roles and conflicts in three common situations, dealing with mold in a school, providing “expert” judgment and guidance for insurance companies and dealing with private homeowners.



**Exhibit 1.**

An industrial hygienist can have multiple roles and responsibilities in relation to mold. These roles may include investigator, risk assessor, risk communicator, liaison, manager and educator. It is important to have your role(s) clearly defined on a project. Performing tasks outside of what you have been hired to do can lead to wasted effort, lack of payment or leave you open to professional liability.

There are several guidance documents for mold related work covering everything from the initial investigation, designing a sampling strategy, planning remediation and verifying the completion of remediation. Some of the common guidance documents can be found in the references section of this document. The issue for an industrial hygienist is that you must determine which, if any of the guidance documents are appropriate for your project. Even if you find guidance applicable to your project limitations such as time, budget and logistics may prevent the adherence to the guidance document. A familiarity with the guidance documents and an intimate understanding of the science that goes into these documents allows the properly trained consultant to adjust to these situations. Mold projects are rarely as simple as following a step by step checklist; this enforces the value of using a properly trained and educated consultant.

The following section will look at the roles that the industrial hygienist may find themselves in when dealing with particular situations. Common areas of concern, confusion and contention will be highlighted. The discussion will include some of the trade-offs that may have to be made to deal with constraints of particular projects and as well as some practical solutions that we have found to be successful.

## Common Areas of Mold Consulting

### School

During the course of work in a school setting it is important that the consultant be aware of the unique situation that they will be facing. First, in a school you are faced with a younger population which are typically more susceptible to negative environmental conditions. Second, in our experience, most schools are older in construction which may have lead based painted components or asbestos containing material which may need to be remediated if they have mold amplification. In a school, the consultant may be tasked with being a risk communicator in the event that the school has no one with experience in the field of mold remediation. Other issues are in the areas of security of the students. When will the work be occurring, during the day when the remediation truck can be seen at the front of the building?

Due to the younger population at risk, it is important that a timely response be made from the onset of a water intrusion to the time of drying efforts commencing. If this is not timely, then subsequent odors and microbial growth will occur in the school. As with all mold projects, all efforts should be made to separate the environment with mold growth with the environments with no mold growth in the means of polyurethane sheets over doors, windows, return air grills and in the installation of negative air HEPA filtration.

It is important that the consultant not only be competent in mold consulting, but also other areas of environmental materials such as asbestos and lead. At this time most schools should have operation and maintenance records for both asbestos and lead and the consultant should ask whether or not affected materials that may need to be disturbed are in fact positive for either material. If the school is not aware, then testing should commence in order to determine the existence of both contaminants. In addition, if asbestos or lead is found to be positive in building materials that are going to be disturbed, then the project becomes an asbestos and or lead project as well and all applicable rules and regulations will apply in the matter of possibly air testing for asbestos in air or lead wipes at the end of the project.

The consultant may be tasked with being a risk communicator in efforts to educate the public of the circumstances of the project. It is important that the consultant be competent in the field of risk communication as not all professionals are qualified. The consultant should discuss not only the technical issues of the project, however discuss what the progress has been, what the schedule is and how the problem will be managed. The consultant should have a clear, concise and clearly understood message that the right people have been contracted in order to get the project done correctly. Explain what the role of the industrial hygienist, contractors and their individual training, the type of equipment that will be utilized. Limit information to what is important, express empathy and care for the project and keep the message short and simple, focus on what is happening and what is going to happen to make the situation back to pre-loss condition. Explain that there is a process that will be executed. You should always come prepared to speak to the public, as stuttered speech and an unclear message may convey as you are not competent.

The consultant should also make the school aware of the perception that will be faced by parents, teachers and students. The process of drying efforts and or mold remediation is not typical for the public. Should remediation activities occur during the school day when parents and students will be seeing a strange truck parked outside of the school along with workers in tyvek and respirators? Typically it is recommended that these activities happen on the off hours to limit

these concerns. In addition, it will serve two fold for security purposes with unfamiliar people in a school with students.

The take home message is that schools have unique hurdles that an experienced consultant should be ready to tackle. The consultant should be experienced with these situations in order to have a successful endpoint with their project.

### Insurance Claims

In insurance claims it is always important to remember that time is money. As a consultant you will be looked upon to ensure that the project is running as smoothly as possible. In addition, you will be looked upon to be a liaison with the mold remediation company, insurance company, the insured and other trades that may be involved. If the consultant has an opposing consultant on the other side of the fence, it is vital that all parties have a similar approach to the project in order for timely progression. Also, to consider in some instances the consultant will be hired in order to determine the cause and origin of a project.

First and foremost, the consultant needs to be at the top of their game, as said before, time is money!!! The consultant needs to be aware that a smooth running project takes effort from different parties and that the consultant should be in the middle of all of those parties, ensuring the progression of the project. When the call comes in the door from your client, either by the insured or the insurance company, the question of a contractor should be posed. Has a drying company been contacted and have they started yet? This is vital in order to limit the damage of affected materials at the property. The consultant should be involved from the very beginning of the project, doing a site walk through of the “first thought” damages, getting copies of floor plans, meeting with all parties in order to establish contacts for the project.

Through the progression of the project, the consultant should be diligent in the documentation process in the forms of mark-ups on floor plans of moisture logs, areas of mold growth, areas that are scheduled to be removed, areas that are cleared, etc. These inspections should be conveyed to the important parties in order to progress the job in a timely matter. The fact is the faster that an area is cleared, the faster the break-down of equipment and materials can happen, other trades can build back the space and business can be back to pre-loss conditions. The consultant is going to be looked upon to limit the claim as much as possible. Again, time is money and the time that a hotel room is not online, means a lost income for the hotel and depending on the policy of the insured, a potential payout by the insurance company. This concept is similar for commercial office space, the time that the space is not online means that the insured needs to get temporary space which costs money, displaces angered employees and a potential payout from the insurance company.

In some instances, the consultant will be looked upon to determine the cause and origin of a claim. In those instances, it is important that the consultant understands their limitations and also be able to prove their point with a reasonably amount of certainty. For instance, in order to satisfy the insurance company, an area of mold growth underneath a window of the same room where a flood occurred must be excluded from the claim. The consultant should be able to prove with a reasonable amount of certainty that this area was not due to the claim due to a host of reasons and be able to prove them. This is important due to the likelihood that if this is not brought up and the area is remediated with addressing the site of that particular water intrusion and subsequent mold growth occurs once again, the consultant is going to be looked upon for their lack of consulting.

Insurance claim moisture and mold projects have their own unique hurdles which need to be addressed by a diligent consultant that has a business savvy mindset. Again, time is money, the more the consultant needs to deal with a learning curve due to lack of experience in this field of mold consulting, the more the claim goes up, up, up!!!

### Private Homeowners

During the course of work with a private homeowner, the first and most vital role is as an educator. The hurdles likely start even prior to the first contact with the client. The client may not be informed as to what makes someone qualified and will likely begin with a search in the local phone book. Qualified environmental consulting firms may not be listed in the phone book under mold; however, less qualified consultants and “fly by night” operations may. If a qualified firm is contacted their prices are usually much higher than those of the less qualified firms. For a private homeowner, the issue of cost can be extremely important. It is vital that you convey to them why a qualified consultant comes at, and is worth, increased cost. The next issue is that of what type of investigation should be done and what that investigation should include. Although the homeowner in some situations may write you a “blank check” and have confidence in your ability to make the best decisions for them, it is still vital that you inform them of the issues. This will be important to justifying your cost at the completion of the project.

Prior to beginning your investigation for a private homeowner you must clearly define the goals of the investigation and the deliverables the client expects. If you are doing an investigation to determine the need for remediation or the cause of mold damage sampling may not be required. The client may, however like that some sampling be done. You must inform the client of the interpretations that can be made from specific sampling schemes prior to sampling. The desire to expand on conclusions after initial sampling may lead to “lost” samples since samples from different days may not be directly comparable. If a mold issue is discovered we are presented with another role and further dilemmas. The industrial hygienist will likely be asked what needs to be done to eliminate the problem. This typically comes in the form of a scope of work. The drafting of a scope of work in residential homes can lead to additional issues as the homeowner may be unaware of the presence of hazardous building materials such as asbestos and lead based paint which may exist in areas that need to be remediated. Sampling these materials can add to costs that homeowners are reluctant to take on or provide them with proof of the presence of other hazards they have been in denial of. The homeowner will often ask for recommendations of qualified mold remediation contractors to carry out the work. One must be careful in recommending contractors as the quality of their work will be associated with the quality of work you have done. Additionally, extra effort should be put forward to determine the cause of mold growth prior to remediation. If the mold is due to a chronic moisture intrusion issue, remediation of affected materials is only a short term fix. When mold returns, your work will be viewed as a failure. Correction of chronic moisture intrusion issues can add significant cost to a project.

If an issue is discovered you may also be required to communicate the risks with the homeowner. This may be difficult since we have already established that we may not have sufficient knowledge. Although proven mold related health effects are typically limited to allergic and irritant type reactions and mycotoxins have not been shown to cause health effect at the levels present in indoor environments conveying this information to skeptical homeowners must be handled delicately. If you look at the situation you can see why this may be difficult. How often

does the nightly news have a story about “toxic black mold”? Didn’t this homeowner just pay you a lot of money to do the investigation because mold is dangerous and unhealthy?

When working with a private homeowner you usually will be working on a limited budget. This will limit the amount of samples, if any, that can be collected. Additionally, most consultants charge on an hourly basis which will limit the amount of time that can be spent on site. This can lead to a dilemma in that a homeowner would like to see that you are doing a thorough job and sample results often brings them some form of comfort. Even simple sampling plans can cause prices to rise rapidly, especially when sampling is being done to determine whether an issue that is not visible exists. For these reasons, inspection must be targeted so that we minimize the time and money spent investigating and sampling areas unlikely to be affected. This targeting starts from the time that the work is accepted. Gaining a detailed history of the residence can save valuable time. Issues such as history of floods, leaks, odors and staining can all be of assistance. This data can be difficult to attain if the how was recently purchased or if it is a situation where the homeowner is with holding information for some reason. A thorough evaluation of the exterior of the home can give clues to locations on the interior which may be affected by water intrusions. On the interior of the home areas where moisture control issues are typically present such as bathrooms, basements and attics. The use of tools such as moisture meters and infrared cameras can help to identify areas of potential concern. The value of samples should be thoroughly analyzed to ensure that they are needed.

One final issue comes in the form of your conclusions. The homeowner may be looking to find comfort in specific wording such as “mold free”, “safe” or “healthy”; however these words will not typically be in your report. Your report will likely contain wording such as “below background”, “significant” or “typical”. This is a situation when the education of clients and informing them from the initial phases of the project is important. You may be judged solely on your providing the desired conclusions at the end of the project.

Working for private homeowners can be fulfilling, but may be less profitable than work for larger companies. Time spent educating and informing the homeowner so that they can make decisions is typically not billable. Budget constraints also may limit the overall effectiveness of the work.

## **Conclusions**

There are several overarching messages presented in this document. These core concepts can be used as guidance on handling unforeseen issues that may come up in the field:

- Be sure to accurately define your roles, your responsibilities and the client’s goals prior to commencement of the project;
- Keep focused on who you work for on the project and be sure that your actions reflect their best interest;
- Be aware of the presence of other consultants present on a project and the interest they represent;
- Be aware of the population that you are serving and the special challenges and perceptions by the population you will face.

- Be competent in areas of other environmental conditions that you make need to consult, if you are not competent in those fields, then subcontract those issues.
- Remember time is money, maintain good working relationships with remediation contractors, laboratories and other trades in order to progress your project.
- Ensure that the data obtained is consistent with the conclusions you make;
- Communicate with the client as a project develops. Keep them apprised of any changes in the work plan or decisions you make; and
- Document everything.

These core concepts are relevant not only to mold, but other areas of environmental health and safety. Focus is often put into making sure regulatory requirements are satisfied and these core concepts are often forgotten. In cases where tasks are not legislatively mandated, such as that of mold, it is important they we keep these core concepts in focus.

## Bibliography

American Conference of Governmental Industrial Hygienists *Bioaerosols: Assessment and Control* Ohio: ACGIH 1999

United States Environmental Protection Agency *Mold Remediation in Schools and Public Buildings* Washington, CD: EPA 2001

Hardin, B.; Kelman, B.; Saxon, A. "Adverse Human Health Effects Associated With Mold In the Indoor Environment" *Journal of Occupational and Environmental Medicine* May 2003: 470-478

Gots, R.; Layton, N.; Pirages, S. "Indoor Health: Background Levels of Fungi" *American Industrial Hygiene Association Journal* July/August 2003: 427-438

Page, E.; Trout, D. "The Role of Stachybotrys Mycotoxins in Building-Related Illness" *American Industrial Hygiene Association Journal* September 2001: 644-648

Baxter, D.; Prekins, J.; McGhee, C.; Seltzer, J. "A Regional Comparison of Mold Spore Concentrations Outdoors and Inside 'Clean' and 'Mold Contaminated' Southern California Buildings" *Journal of Occupational and Environmental Hygiene* January 2005: 8-18

Fung, F.; Hughson, W. "Health Effects of Indoor Bioaerosol Exposure" *Journal of Occupational and Environmental Hygiene* 2003: 535-544

Robbins, C.; Swenson, L.; Neally, M.; Gots, R.; Kelman, B. "Health Effects of Mycotoxins in Indoor Air: A Critical Review" *Applied Occupational and Environmental Medicine* 2000:773-784

IICRC S500, *Standard and Reference Guide for Professional Water Damage Restoration*, Second Edition, Vancouver, Washington 1999



IICRC S520, *Standard and Reference Guide for Professional Mold Remediation*, First Edition, Vancouver, Washington 2003

American Industrial Hygiene Association, *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, Second Edition, 2005

American Industrial Hygiene Association, *Assessment, Remediation and Post-Remediation Verification of Mold in Buildings*, AIHA Guideline 3-2004

*Guidelines on Assessment and Remediation of Fungi in Indoor Environments*, New York City Department of Health and Mental Hygiene