MOLD + ASBESTOS = RECIPE for DISASTER

By W. Lee Capell

With so much focus on mold in the past several years, it is easy for consultants to lose sight of the bigger picture. This is particularly true for inexperienced consultants who have identified themselves as mold "experts." To illustrate this point, look at *Photograph 1*. What do you see? One's answer may be dependent upon his or her profession and experience.

Photo 1. Mold growing on asbestos and lead-based paint.

If you answered *Aspergillus versicolor* (mold) actively growing on a 10% Chrysotile (asbestos) textured ceiling with a concentration of 2.4 mg/cm^2 lead (lead-based paint), you would be correct. Unfortunately, all too often we tend to only see the mold, and the other critical parts of the problem – Asbestos Containing Building Materials (ACBM) and Lead-based Paint (LBP) – have been completely ignored. This can lead to needless exposure to unknown contaminants for workers and occupants, as well as fines and possible incarceration.

Now look at *Photograph 2*. What do you see? Very similar to *Photograph 1*; however; there is neither asbestos (>1%) in the ceiling texture nor lead (>1.0mg/cm^2) in the paint.

In February 2002, the author was requested by a property and casualty insurance company to examine several rooms in a hotel for mold and provide a scope of work for remediation. The toilet on the second floor had overflowed and damaged several rooms on the first floor. When the consultant arrived on site, the remediation contractor had removed the carpet from the floor and interior gypsum wallboard from the walls. The only thing remaining was wood framing where the bathrooms used to be and a textured ceiling on the bot-

Photo 2. Mold growing over a shower.

tom of the concrete floor slab. The contractor informed the consultant that a work crew would be in the next day to scrape the textured ceiling. Unfortunately, the contractor had seen the mold on the ceiling texture, but he did not see the asbestos-containing material.

Photo 3: From USA Weekend.

Mold Regulations (or Lack Thereof)

Terms such as "Mold is Gold" have helped flood (no pun intended) our market with mold experts. This is largely because, until recently, the mold industry was primarily unregulated. Texas has taken the lead on mold regulations. Currently, several states have proposed or recently enacted legislation that deals with mold (investigation, remediation, etc.). Unfortunately, in many states, anyone can hang a shingle and claim to be a mold expert. On the other hand, asbestos issues have existed over a relatively long period of time and are closely regulated.

There are those who believe the asbestos industry is over-regulated and that the industry was too hasty in wanting to remove asbestos. In 1978, the Environmental Protection Agency (EPA) banned the use of spray-on asbestos in the United States. In 1986, the EPA required that all schools be inspected for the presence of asbestos *(Photograph 3)*. The subsequent media attention that asbestos received resulted in public fear, panic, and hasty programs to remove asbestos, although removal was never required. The cost to remove asbestos from schools plus public and commercial buildings has been estimated at $50 to $150 billion! Currently, the United States spends $1 - 4 billion annually on asbestos removal. The fear of over-regulation may account for the lack of regulation with regard to mold.

When comparing mold and asbestos, we can see other factors that may be affecting the lack of legislation in the mold industry.

- There is a finite quantity of asbestos-containing materials in schools, homes, and buildings in the United States and eventually, our buildings will be asbestos free. Mold was documented in the Bible. It is here today and it will be here tomorrow. We will never be mold free.
- Six naturally-occurring minerals are considered "asbestos." Three were commonly used in various products (chrysotile, amosite, and crocidolite). (See *Figures 4* and *5*). Three other asbestos minerals were seldom used (tremolite, actinolite, and anthophyllite) and are rarely found today. There are thousands of different types of mold.
- The primary route of exposure for asbestos is through inhalation. With mold, the routes of exposure are inhalation, ingestion, and dermal contact.
- The health effects associated with exposure to asbestos are more clearly understood and defined: lung cancer, asbestosis, and mesothelioma (see *Photos 6* and *7*). Molds and other fungi may adversely affect human health through three processes: allergy, infection, and toxicity.

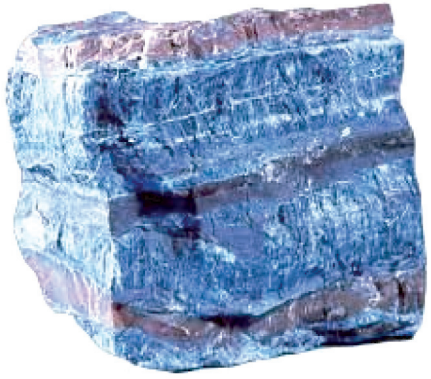

Photo 4: Raw blue asbestos.

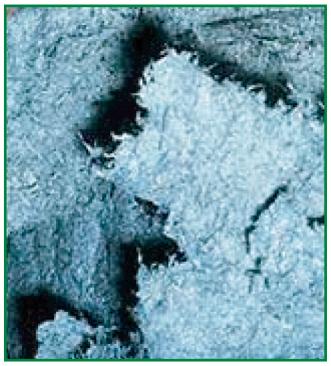

Photo 5: Processed blue asbestos (Crocidolite).

In May 2004, the Institute of Medicine released a report called "Damp Indoor Spaces and Health." An article published in the July 2004 edition of *Indoor Environmental Connections*, commenting on the IOM report, stated, "The Institute of Medicine could not find evidence that there was a causal link between damp indoor environments or its agents, including mold, and health effects that are attributed to it. However, it did not rule out the possibility." The report went on to say, "The Institute of Medicine says there is sufficient evidence of an association between health outcomes such as upper respiratory (nasal and throat) tract symptoms, coughing, and wheezing and the presence of mold or other agents in damp indoor environments." The key to understanding these two statements

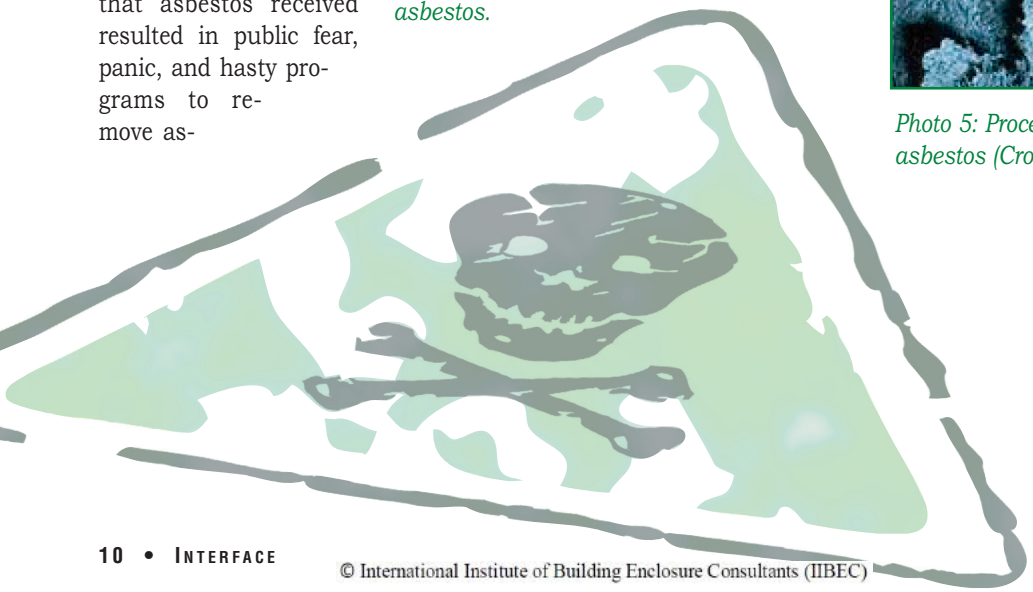

Photo 6: Normal lung (left).

Photo 7: Mesothelioma lung (below).

is understanding the difference between link and association. The term "link" implies causation. "Association" suggests that certain conditions co-exist. In summary, there is an association between mold and adverse health effects, but there is no causal link.

Asbestos Regulations

As required by 40 CFR 61, Subpart M, the National Emission Standard for Hazardous Air Pollutants (NESHAP), Section § 61.145 (Standards for demolition and renovation), an owner or operator of a demolition or renovation activity shall ensure that a building inspection to detect the presence of ACM, including Category I and Category II nonfriable ACM, has been performed prior to any renovation or demolition activity at a regulated facility or part of the facility where the demolition or renovation activity will occur.

As mentioned earlier, the EPA requires that all schools be inspected for the presence of asbestos (40 CFR 763) and that each inspection be made by an accredited inspector. Appendix C to Subpart E of 40 CFR 763 (Asbestos Model Accreditation Plan) took the inspection process one step farther and required all persons who inspect schools or public and commercial buildings to be accredited.

Photo 8: Mold on asbestos-containing pipe insulation.

Photo 9: Mold on gypsum wallboard with asbestos-containing joint compound.

To put these requirements into perspective, consider the following definitions:

- **Renovation –** Altering a facility or one or more facility components in any way, including the stripping or removal of regulated asbestos-containing materials (RACM) from a facility component. "Remodeling" is also considered renovation.
- **Demolition –** Wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations, or the intentional burning of any facility.

The bottom line is, prior to beginning a mold remediation project in a public or commercial building, an asbestos inspection is required if there is the potential to disturb asbestos-containing building materials.

Keys to Success

The keys to a successful project where there is fungal growth on asbestos-containing building materials are:

1. Hire a consultant who can perform both the asbestos inspection and mold investigation. This person should be capable of providing a scope of work for mold remediation and be licensed and accredited to provide a project design for asbestos abatement.
2. Hire a contractor who is licensed, insured, and qualified. This may be difficult to determine unless the client has dealt with the contractor before. Several states have passed laws with respect to persons performing mold assessments and/or remediation. Relevant excerpts of several examples are described below.
   a. Louisiana House Bill No. 1328 states, "no person shall engage in or conduct or advertise or hold himself out as engaging in or conducting the business of or acting in the capacity of a person who conducts mold remediation unless such person holds a mold remediation license as provided for in this Chapter."
   b. Texas H.B. No. 329 states, "a person may not engage in: (1) mold assessment unless the person holds a mold assessment license; or (2) mold remediation unless the person holds a mold remediation license."
3. Hire a consultant who is reasonable, practical, and best fits the needs of the client. No one wants a consultant who is going to shut down a building and make the project a media event! On a recent project in which the author was involved, another consultant was called in, at which time the other consultant recommended calling the media to set up a press conference and evacuate the building immediately.
4. Don't allow the mold remediation contractor to perform the mold assessment (fox guarding the hen house).
   c. Louisiana House Bill No. 1328 states, "B.(1) No licensee shall perform both mold assessment and mold remediation on the same property. (2) No person

shall own an interest in both the entity which performs mold assessment services and the entity which performs mold remediation services on the same property."

d. Oklahoma House Bill HB2554 states, "any person that engages in the practice of mold assessment or mold remediation shall not perform both services for a consumer on the same property or structure."

5. In keeping with #4, do not allow the asbestos abatement contractor to perform the air monitoring during removal. Laws will vary from state from state; however, the South Carolina Department of Health and Environmental Control (SCDHEC) Regulation 61-86.1 states, "Area air sampling data collected by a licensed air sampler under contract with or employed by the asbestos contractor performing the abatement shall not be acceptable to the Department." Whether or not the local regulatory agency has this or a similar provision in the applicable state regulation, be sure to check, and don't let the fox guard the henhouse!

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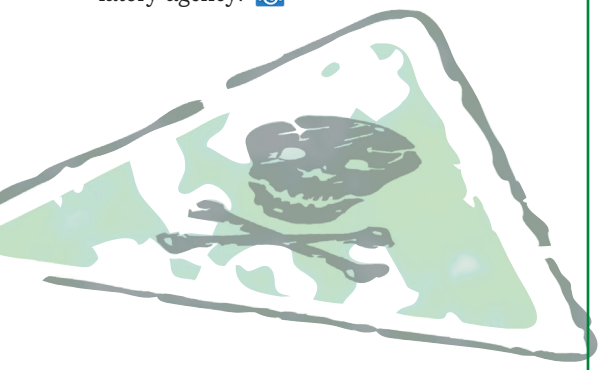
6. Hire a qualified contractor who can perform both the mold remediation and asbestos abatement. This will save time and money if the contractor is experienced in both mold and asbestos.
7. Proper sequencing of events should save time and money. Many of the procedures and specifications used in mold remediation projects are borrowed from the asbestos industry. They include: 1) using polyethylene sheeting to cover openings and penetrations into the work area, and 2) placing the work area under negative pressure with respect to adjacent areas during remediation.
8. Before any mold remediation begins, clearly define the criteria that will be used to warrant satisfactory completion of work and ensure all parties involved understand these criteria.

In conclusion, the key challenges facing those responsible for dealing with mold in asbestos-containing building materials and lead-based paint are: 1) know the law, 2) understand the facts, and 3) make scientifically sound decisions. So before starting a

mold remediation project, look at the picture from all sides. Whether the project involves mold, asbestos, lead-based paint, or some combination, make sure any and all environmental hazards are properly identified and assessed. Doing the project the correct way will save all parties time and money and possibly a fine from the state's regulatory agency.



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W. Lee Capell of Applied Building Sciences Inc., has a BS in chemical engineering from the University of South Carolina. He provides environmental consulting services and has been responsible for performing asbestos investigations and project designs, overseeing asbestos and lead-based paint programs (including XRF surveys and air monitoring), conducting indoor air quality investigations, and designing mold remediation protocols. Mr. Capell has also provided mold-related services, including investigations, project specifications, and/or supervision for mold remediation throughout South Carolina for schools, health care facilities, and the South Carolina Governor's Mansion. He also provides expert testimony and legal support during mold-related litigation. Mr. Capell was instrumental in developing the current IAQ Investigation and Mold Remediation classes at the Medical University of South Carolina.

D-08 ISSUES CALL FOR PAPERS

ASTM Committee D-08 on Roofing and Waterproofing will hold a one-day symposium, "Roofing Research and Standards Development," in December 2007. It will be the sixth in that series. Papers are being solicited for presentation at the meeting. Abstracts are to be sent to ASTM headquarters by October 15, 2005.

For further information, contact steering co-chairmen Tom Wallace or Walt Rossiter.

PAPERS SOUGHT FOR GREENING ROOFTOPS FOR SUSTAINABLE CITIES CONFERENCE

Green Roofs for Healthy Cities is seeking papers for its Fourth Annual International Greening Rooftops for Sustainable Cities Conference, Awards, and Trade Show May 11-12, 2006 in Boston, MA. Conference streams fall under Policy, Design and Case Studies, and Research. A 300-word abstract and 50-word biography should be submitted by Sept. 30, 2005, with final papers due by Jan. 13, 2006. For more information, visit www.greenroofs.org.

ROOF COLLAPSES ON KELSEY

Kelsey Roofing Industries, a well-known British roofing company in existence for 86 years, "went into administration" (filed bankruptcy) recently. Kelsey Roofing was bought out from its parent company, Kelsey Industries, by Bob Hann and Roy Samways in February 2000.

— Roofing, Cladding, & Insulation