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QUARTERLY REVIEW

An Overview of Mold Contamination

By Michael K. De Chiara and Jenifer B. Minsky

In a recent seminar entitled, "Water Intrusion and Mold Remediation in New York," Zetlin & De Chiara LLP assembled a number of experts in the fields of biology, engineering and science, as well as our own attorneys, to discuss the implications of mold contamination for building owners and building and design professionals. This article reviews certain legal issues which arise frequently in connection with mold contamination litigation.

Mold is a naturally occurring organism that has existed for millions of years. Within the last few years, however, the fear of mold contamination has become widespread.ⁱ Newspapers such as *The New York Times* and *The Wall Street Journal*; magazines, including *Time* and *People*, and television shows, such as *48 Hours* and the *Today Show*, have all featured mold-related stories in the last few years.ⁱⁱ Stories about mold contamination became particularly pervasive in 2001, when a Texas court awarded a family \$32.1 million in a mold contamination lawsuit against its insurance company.ⁱⁱⁱ

Numerous Potential Defendants

Potential defendants in mold contamination lawsuits are many. For instance, general contractors may be responsible for breach of warranty or negligent selection of subcontractors.^{iv} Subcontractors and construction managers face liability for deficient workmanship or materials.^v

Property managers and building owners may also be liable for improper maintenance of a building.^{vi} Potential lawsuits may take the form of breach of contract or negligence.^{vii} The Policyholders of America reported that from 1987 to February of 2002, there were six cases in which lawsuits against commercial or municipal building owners resulted in awards or settlements of at least \$1 million.^{viii}

HVAC systems can breed mold when air filters become adulterated with moisture and when mold grows as the result of stagnant water in drip pans or from moisture inside air ducts.^{ix} These problems have been attributed to both improper design and maintenance.^x Consequently, HVAC manufacturers, retailers and service companies may also be the target of mold contamination litigation.^{xi}

Other Claims and Defendants

Mold growth can result in claims against architects and engineers charging that they failed to properly design a building or to select suitable construction materials.^{xii} Molds produce tiny spores that waft continually through the air, both indoors and outdoors.^{xiii} When mold spores land on a suitable location, they cultivate if there is a sufficient nutrient source and suitable temperature and moisture levels.^{xiv} An abundance of materials used in buildings and construction may provide a suitable nutrient source.^{xv} Such sources include "materials containing cellulose, such as gypsum wallboard, wood paneling, plywood, oriented strand board (OSB), pre-cast panels and ceiling tiles; fabrics and carpets;

upholstered furniture" and fiber glass-lined air ducts.^{xvi}

Contractors must also be concerned about lawsuits arising from mold contamination. Any mold problem that develops on a construction project or in a building may spawn workers' compensation claims, personal injury and property damage lawsuits, and costly remediation demands.^{xvii} These claims can result in enormous financial losses, construction delays and negative publicity.^{xviii} According to the Policyholders of America, from 1987 to February of 2002, there were ten cases against contractors that resulted in an award or settlement of at least \$1 million.^{xix}

Litigation

In the case of *Ballard vs. Fire Insurance Exchange*,^{xx} plaintiffs sued their insurance company for failing to cover the necessary repairs to a water leak in their home that fostered a dank, humid, mold-friendly environment. The Ballard family was awarded \$32 million, including \$12 million in punitive damages and \$8.9

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Legal Updates

Court finds construction manager's negligence in a personal injury claim immaterial for insurance purposes, holding the subcontractor's insurer must reimburse the construction manager for defense costs. *Tishman Construction Corp. of New York, et al. v. American Manufacturers Mutual Ins. Co.*, 757 N.Y.S. 2d 535 (N.Y. App. Div. 2003).

Appellate Division rules that an insurance clause extending coverage to persons or organizations required by a "work contract" to be named as additional insured, but does not specify a construction site owner or property manager, will not act to insure such individuals. *Trapani v. 10 Arial Way Associates, et al.*, 301 A.D.2d 644; 755 N.Y.S. 2d 396 (N.Y. App. Div. 2003).

Appellate Division finds contractor too far removed from engineer to assert a negligent misrepresentation claim regarding pre-existing subsurface conditions. *Marcellus Const. v. Vill. of Broadalbin*, 755 N.Y.S. 2d 474 (N.Y. App. Div. 2003).

New York's highest court reaffirms limitations on ability of third-parties to impose tort liability on construction contractors. *Church v. Callanan*, 99 N.Y.2d 104; 782 N.E.2d 50 (2003).

An Interview with Aerobiologist Christine A. Rogers, Ph.D.

With Michael K. De Chiara

Dr. Christine A. Rogers is an aerobiologist and senior research scientist at Harvard School of Public Health and she is an expert on fungi and pollen. She participated in the recent Zetlin & De Chiara seminar entitled, "Water Intrusion and Mold Remediation". She is the Secretary General of the International Aerobiology Association and the Past Vice President of the Pan American Aerobiology Association. Dr. Rogers may be reached at crogers@hsph.harvard.edu. We asked her to address some key issues and questions about mold.

MKD: Dr. Rogers, comparisons are often drawn between asbestos and mold in terms of potential liability. Is that an apt comparison?

CR: On a very tangential level. Asbestos is a substance that we purposely put in our environment, can remove, and can regulate, whereas mold is a natural, constant, and necessary component of our environment that will defy regulation. In addition, asbestos potentially affects anyone who comes in contact with it. In most cases for mold to be harmful, a person must be predisposed genetically and have developed a sensitivity to fungi. Once that has happened, reactions can be quite severe. We have clear, unequivocal evidence of the negative impact of mold on allergic and/or asthmatic people. Most fungi produce proteins that could cause an allergic reaction after exposure, although only some people will be reactive. For allergies and asthma, it is not just fungi in general that are a problem, but specific people who are reactive to specific fungi. Currently, there is great debate as to the importance of toxic effects of fungi to the general population. However, studies to date show little evidence of toxic health effects except in extremely high concentrations which are unlikely to occur in indoor settings. So, with the narrowing of potentially affected individuals, the extremely rare situations where fungi can toxically harm a person, and the difficulty in regulating these organisms, the comparison between asbestos and mold is weak. However, the techniques used to carefully

remediate asbestos have been applied to remediation of fungal contamination with great success. Mold litigation has awarded lots of dollars to plaintiffs, just as asbestos litigation has done, but more as a result of a fear factor, rather than an empirically sound and scientific linkage as you have with asbestos and health effects.

all of those conditions. Toxic effects are known to occur upon very large exposures to mycotoxin, such as ingestion of contaminated food or in an agricultural setting—hay baling, for instance—where people are exposed to fungal spores in enormous quantities. However, there is no good evidence that any reasonable exposure in



Basidiocarpsfungi, a variety of toxic mold.

MKD: How does mold affect human health?

CR: Two ways. As I said earlier, first through allergic sensitization. Secondly, mold can affect humans toxigenically in that a fungus may produce secondary metabolites (mycotoxins) that have toxic effects (immunosuppression, carcinogenesis, cytotoxicity, neurotoxicity). Secondary metabolites are substances not needed for growth or reproduction; fungi use these secondary metabolites as biowarfare weapons to clear space for themselves and roust other fungi or bacteria. Fungi that can produce these mycotoxins, do not always do so. There are a host of environmental conditions that will promote or inhibit toxin production. We do not know

an indoor environment is harmful to humans, so to characterize mold generally as "toxic" is fundamentally incorrect scientifically, and I guess I don't have to mention the issues that such a blanket characterization would cause in litigation.

MKD: I don't think you do! What causes fungi to grow?

CR: Outdoor air is the chief source of indoor fungi. Normally, quantities of fungal spores in outdoor air far exceed those indoors except during times of snow cover. Fungal spores are constantly entering our indoor environments; all they need is moisture and an organic surface to grow on. Almost any building material can provide sufficient nutrients for fungi

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Recent Developments in Mold Legislation

By Matthew S. Quinn and Billy P. Chimos

Michael Jordan, Erin Brockovich, Mia Hamm, Broadway impresario James Nederlander, and Ed McMahon. What do these famous people have in common? Their residences/buildings have been plagued with mold.¹ While mold has existed for millions of years, it has only recently become a major source of insurance claims and litigation. With the fear of mold contamination on the rise, plaintiffs' attorneys have a choice of targets for lawsuits involving mold. Some of the potential defendants are "contractors, subcontractors, construction managers, property managers, architects, construction component suppliers, and building owners, as well as commercial and personal lines insurers."²

While there is no consensus as to acceptable levels of mold particles in indoor environments, there is agreement that mold, a biological contaminant, may cause at least minor health effects, such as allergic reactions.³ Common symptoms associated with allergic reactions are running nose, eye irritation, cough, congestion and aggravation of asthma.⁴ Others contend that mold can be the cause of significant health problems, such as Organic Dust Toxic Syndrome or Hypersensitivity Pneumonitis, which can result in permanent lung damage.⁵ California has led the way in addressing the mold problem with the enactment of the Toxic Mold Protection Act of 2001.⁶ The law, which went into effect on January 1, 2002, requires the California State Department of Health Services (CDHS) to convene a task force including health and medical experts, mold abatement experts, government representatives, representatives from California, employers and employees, affected consumers and affected industries.

The Act requires sellers of property to disclose that there is mold on the property if they have direct knowledge of its

existence. The Act also requires the CDHS, provided that it has the necessary funds, to identify tolerable limits for human exposure to molds (called "Permissible Exposure Limits", or PELs), to develop guidelines for toxic mold identification and remediation, to post its findings on its web site and disseminate them to interested parties, and to provide a progress report this year. The task force is charged with reviewing the guidelines for mold at least once every five years and revising them as necessary, based upon the availability of any new scientific data.⁷

Many other states have also introduced legislation regarding mold. For example, Maryland⁸ passed legislation in July 2001 which established a Task Force on Indoor Air Quality. Similarly, Pennsylvania⁹ adopted legislation urging the Department of Health to create a task force to investigate the health effects of toxic mold. In June 2001, Nevada¹⁰ enacted legislation that authorized the issuance of bonds to finance capital improvements for toxic mold remediation and prevention. However, in Arizona,¹¹ Connecticut,¹² and Indiana,¹³ efforts to pass legislation addressing concerns regarding mold failed.

Locally, the New York State legislature has proposed a bill regarding mold that, as of January 23, 2003, was referred to the Senate Health Committee. New York's proposed Toxic Mold Protection Act provides for the establishment of a task force to advise the Department of Health on standards regarding mold.¹⁴ It also requires that the task force consider adopting permissible mold exposure limits.¹⁵

In New Jersey, an even more exhaustive bill was introduced to the legislature and referred to the Environment Committee on November 19, 2001.¹⁶ This proposed legislation "died" at the end of the 2000-

2001 Legislative Session and the bill's sponsor failed to reintroduce it during the 2002-2003 Legislative Session. Under this failed legislation, a residential seller would have been required to disclose all known mold hazards to a prospective purchaser of a home¹⁷ and the prospective purchaser

"Construction, design and real estate professionals must be aware of the rising tide of mold claims and litigation, and try to address and properly distribute the risks..."

would have been given the opportunity to inspect the home for mold.¹⁸ The bill also would have established a program for the certification of mold inspectors and remediators¹⁹ and provided financial assistance of up to \$20,000 for mold remediation and temporary relocation to a particular dwelling.²⁰ The bill also called for the establishment of a Mold Hazard Code, which would have set standards regarding mold for the construction of schools and residences.²¹ Under the proposed legislation, permits would not have been issued for the construction of a school or residence until it was documented that the construction would be in accordance with the Mold Hazard Code.²² There are no other bills relating to mold pending in the current New Jersey Legislative Session.

On the federal front, Congressman John Conyers of Michigan introduced the United States Toxic Mold Safety and Protection Act (the "Melina Bill"). The bill, which applies primarily to residential and government buildings,²³ requires a mold inspection prior to the sale or lease of all residential property, with the results disclosed to the buyer or lessee.²⁴ An inspection must also be conducted before a federal agency may make, insure or guarantee a loan for residential property.²⁵

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Mold Problems and Moisture Control

By Valentine A. Lebr, P.E., Lebr Associates Consulting Engineers, LLP

Moisture is a key element in the development of mold and mildew, and the control of moisture is essential in avoiding and remedying their occurrence.

Moisture can become a problem and contribute to mold generation from a number of sources, both internal and external. A common source of moisture accumulation is water penetration of the building envelope, mainly through roofs, facades, and foundations. The latter leads to the experience of the damp and dank cellar that so many have personally experienced and now associate with mold and mildew. Roof leaks, and water penetration of exterior walls also cause local areas of moisture accumulation and these in turn spawn mold growths with their corresponding odors and potential for serious damage. Roof and facade failures are difficult because the water accumulations are often quite distant from the actual point of entry through the building envelope. In very humid areas, the actual moisture penetration is often not water flow from a severe storm, but rather moisture penetration that occurs in the form of gaseous water vapor passing from warm external conditions through a wall without an appropriate vapor barrier to the cooler interior. A well designed roof and facade is key to avoiding these external sources of moisture, and that includes special attention to potential vapor transmission and the means of stopping it at an appropriate point.

Moisture can also be generated internally with a long, hot, steamy shower being the classic example of an internal water source that creates mold potential. The frequent correlation between steamy showers and bathroom mold is strong testimony to this mechanism of mold growth. In a similar manner steam baths, jacuzzis, boiling pasta in the kitchen, and a variety of other home equipment and appliances add moisture to spaces, raising the relative humidity levels and fostering mold growth.

Perhaps the most serious internal water problems are associated with pipe network leaks. Often these are slow leaks that drip for extended periods of time, saturating significant portions of a building's construction. Internal pipe related moisture problems can involve leaking pipes, leaks emanating from valves, especially valve stem leaks, leaky air vents, and connections to various plumbing fixtures. Condensation on piping without proper insulation and vapor barriers is also a continuing problem. Condensation occurs when warm humid air contacts a cold surface that has a temperature below the air dew point. The mechanism of internal condensation on piping is identical to the condensation we experience on warm summer days on a glass holding iced tea.

"The building exhibited exceptionally high concentrations of carbon dioxide that tended to make the occupants lethargic."

Moisture Control

When internal moisture from the previously mentioned sources wets portions of the structure for extended periods, conditions then exist to permit and promote mold growth. Dealing with internal moisture problems involves two different approaches. First, maintenance is essential to keep all of the internal materials, equipment, and systems in excellent operating condition. Preventative maintenance can stop problems before they begin by fixing potential problems before they happen, but in any event, if a leak exists, it must be fixed immediately.

The second approach to control moisture depends on a proper ventilation of internal spaces. We are all familiar with the various conditions of air. Sometimes the air is

dry, causing lips and skin to dry and crack, causing irritation of the eyes and mucus membrane tissues, and promoting static electrical shocks of monumental proportions. The properties of air are defined on the psychrometric chart, the tool engineers employ in designing air conditioning systems to achieve comfort, both in terms of temperature and relative humidity.

When moisture builds up in a space, it saturates the adjacent air causing an even wider spread of moisture, both within the space, and via vapor transmission throughout much of the construction. Wallpaper, sheet-rock, and masonry walls are very susceptible to vapor penetration and internal moisture buildup. Ventilation controls these adverse conditions by removing high humidity saturated air, and replacing it with fresh drier air that is capable of absorbing and removing more moisture, both lowering the ambient humidity and drying wet surfaces.

Sources of Moisture

A building investigated some years ago experienced some severe moisture and mold problems. Early investigations focused on leakage through the building envelope, but it was quickly determined that there was no leakage, at least nothing remotely sufficient and widespread to account for the observed internal buildup of water. Attention then centered on the HVAC system, and it became apparent that this sealed (non-operable windows) structure lacked both supply and exhaust systems. The moisture buildup causing the mold problems was internal moisture from jacuzzis, showers, cooking and moisture given off by the occupants themselves. Moisture was not the only problem in this building. It also exhibited exceptionally high concentrations of carbon dioxide that tended to make occupants lethargic.

Outside air is both a benefit and at times a cause of mold problems. Closed occupied spaces are required by code to be supplied

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million in legal fees.^{xxi} A Texas jury found that the insurance company acted in bad faith, fraudulently and intentionally holding back important information from the claimants after mold had been found in their home.^{xxii} The court in *Ballard* held that the insurer had a duty to inform the homeowner of the appearance of toxic mold.^{xxiii} This case is presently under appeal.^{xxiv}

In November of 2002, three developers and the City of Carson City, Nevada, agreed to pay \$14.5 million in settlement of a lawsuit filed by homeowners who claimed that they suffered from mold-related illnesses resulting from substandard construction.^{xxv} The residents claimed that they should have been alerted to groundwater problems that caused mold growth.^{xxvi}

“The residents claimed that they should have been alerted to groundwater problems that caused mold growth.”

At the same time, however, a jury in California rejected the request of a homeowners’ association for more than \$2 million from the makers of exterior insulation.^{xxvii} The association claimed that toxic mold had developed in 18 homes as a result of water damage to the insulation.^{xxviii} After deliberating for less than three hours, the jury returned a defendant’s verdict.^{xxix}

Texas, the venue for the *Ballard* case, along with California and Tennessee, have the greatest number of mold claims.^{xxx} Although states in warm climates have more difficulty with mold, other states are not immune to such problems and claims. There have been numerous cases involving mold contamination in states across the country, including New York.

Davis v. Henry Phipps Plaza South^{xxxi} generated a large amount of publicity in New York due to the enormous damages being

sought. Four hundred and ninety five apartment residents brought suit against the building owners and management claiming that mold had caused them physical injury and property damage.^{xxxi} The plaintiffs sought \$9 billion in damages.^{xxxii} Unfortunately, the case has little value as it was settled for an undisclosed amount after two months of trial.^{xxxiv}

Bases of Liability

Two important legal issues have appeared in many mold contamination cases. The first is causation; the second is the statute of limitations. In order to prevail in a mold contamination case it is insufficient to prove merely that mold exists in a building in which plaintiff lives or works. Plaintiff must also prove that he or she has physical symptoms and that they were caused by mold for which defendant was responsible.

In order to break the chain of causation, a defendant in a mold contamination case should investigate other locations where plaintiff may have been exposed to mold. Defendant should also seek out experts to determine if the amount of mold to which a plaintiff was exposed is sufficient to cause his or her symptoms. Currently there are no national standards for determining how much exposure is harmful, thus this will be determined on a case by case basis. Other issues that impact on causation are whether plaintiff’s symptoms are consistent with the known effects of mold at a particular level of exposure and whether there may be other causes of plaintiff’s symptoms. Once it is determined that plaintiff has been exposed to mold and that the mold has caused his or her injuries, the final inquiry is to identify the party responsible for the mold.

Causation was a significant factor in the New York case of *Oke v. Phipps*. The evidence in that case revealed mold growth inside a building. The defendant building owner argued that there was insufficient mold to cause disease. Plaintiff and defendant each put forth experts supporting their positions. The Court determined that it was a question

for a jury to decide. Although the defendant was unable to obtain a dismissal of the case based on causation, it would have been able to raise the question with the jury. The case, however, ultimately settled for an undisclosed amount.

In the Delaware case of *New Haverford Partnership v. Stroot*,^{xxxv} defendant landlord raised a number of issues regarding causation. Defendant argued that plaintiff’s expert failed to exclude other possible causes of plaintiff’s injuries. The Court rejected this argument, holding that the expert followed a scientifically accepted procedure in ruling out other possible causes. The Court also held that the “foundation for an expert’s causation opinion need not be established with the precision of a laboratory experiment.”^{xxxvi} Additionally, defendant argued that

“Molds produce tiny spores that waft continually through the air, both indoors and outdoors.”

plaintiff’s experts failed to establish a baseline from which to compare the mold levels in plaintiff’s apartment. The Court again rejected this argument, holding that even though the expert had not conducted extensive testing on areas outside plaintiff’s apartment, he had tested the outside air and found the level inside to be ten times higher. The Court held that the amount of testing goes to the weight of the opinion, not the admissibility. None of the defendant’s arguments were successful, however, and an award of \$1,040,000 was upheld.

Likewise in *Centex-Rooney Constr. Co., Inc. v. Martin County*,^{xxxvii} the defendant argued that the principle underlying plaintiff’s expert testimony was not generally accepted in the scientific community. The Court

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found sufficient the experts' testimony regarding numerous scientifically accepted publications that recognized the link between exposure to toxic mold and adverse health effects.

The statute of limitations defense has generally been more successful than causation. For every cause of action there is a time limit set by law in which plaintiff may commence suit. After that period of time has expired, plaintiff is prohibited from bringing an action. The statute of limitations begins to run on the accrual date. Plaintiffs have argued that a cause of action for exposure to mold accrues when plaintiff identifies the cause of his or her symptoms. The Courts in two New York cases, *Searle v. City of New Rochelle*^{xxxviii} and *Harley v. 135 83rd Owners Corp.*,^{xxxix} held that the cause of action accrues when the injury manifests itself, not when plaintiff relates his or her symptoms to mold. This is a particularly important issue in mold contamination cases because plaintiffs often do not identify mold as the cause of their symptoms immediately. Accordingly, the statute of limitations must be analyzed closely by both plaintiffs and defendants in mold contamination cases. The statute of limitations in New York can be anywhere from three years to six years depending on the cause of action and the type of defendant.

"The statute of limitations defense has generally been more successful than causation."

Health and Property Damage

While there is no consensus as to whether exposure to mold can cause serious health problems,^{xl} there is agreement that mold, a biological contaminant, can cause minor health effects.^{xli} Mold, moreover, can cause damage to a property's structure. If mold becomes established in the wood in a home or other building, it can cause cracks in the

wood fiber that pull in moisture and carry it to other areas of the wood, causing extensive damage.^{xlii} Mold can be unsightly as well. It is in the best interests of design, construction and maintenance professionals to be mindful of the possibility of mold. This has become even more important in recent years with the growth of mold contamination litigation.

ⁱ Brett Hanavan, *Mold is the New Menace to the Industry* (2002) at [http://www.toughnotes.com/rnmagazine/2002/January 02/01 p 30 htm](http://www.toughnotes.com/rnmagazine/2002/January%2002/01%20p%2030.htm).

ⁱⁱ Ann Deering, *Beyond Sick Building Syndrome: Mold Litigation Enters the Main Stream*, RISK MANAGEMENT MAGAZINE, November 2001 at 13.

ⁱⁱⁱ Greg Mazurkiewicz, *Mold Legislation to Go National* (2002) at <http://www.achrnews.com/news/cda/articleinformation/coverstory/bnpcoverstoryitem>.

^{iv} MEALEY'S LITIGATION REPORT, Mold, Vol. 1, Issue #12, December 2001 at <http://www.mealeys.com/mold.html>.

^v *Id.*

^{vi} *Id.*

^{vii} *Id.*

^{viii} Mold Update, *Five Reasons Why Mold Is Not the 'Next Asbestos'*, July 16, 2002.

^{ix} *An Office Building Occupant's Guide to Indoor Air Quality* (1997) at <http://www.epa.gov>.

^x Robert E. Geisler, *The Fungusamongus: Sick Building Survival Guide*, 8 ST. THOMAS L. REV. 511 (1996).

^{xi} MEALEY'S LITIGATION REPORT, Mold, Vol. I, Issue #12, December 2001 at <http://www.mealeys.com/mold.html>.

^{xii} *Id.*

^{xiii} *A Brief Guide to Mold, Moisture and Your Home* at <http://www.epa.gov/iaq/molds>.

^{xiv} Foundation of the Wall and Ceiling Industry, *Mold: Cause, Effect and Response*, Chelsea Group, Ltd. (2002) at <http://www.awci.org/mold-series-1.pdf>.

^{xv} *Id.*

^{xvi} *Id.*

^{xvii} Michael F. Dehmler, "Toxic" Mold Part II: If You Work on Building Construction Projects, This is Your Problem, and the Stakes are High. Know the Risks, and Learn How to Avoid Them, CONSTRUCTOR, November 2001 at 16.

^{xviii} *Id.*

^{xix} Mold Update, *Five Reasons Why Mold Is Not the*

'Next Asbestos', July 16, 2002.

^{xx} Index No. 99-05252, Travis County Dist. Ct. (Texas 2001).

^{xxi} Ann Deering, *Beyond Sick Building Syndrome: Mold Litigation Enters the Main Stream*, RISK MANAGEMENT MAGAZINE, November 2001 at 13.

^{xxii} *Id.*

^{xxiii} *Id.*

^{xxiv} *Id.*

^{xxv} *Lauriel Santoyo, et al. v. Stanton Park Development, et al.*, No. 99-01640A, Nev. Dist., Carson City.

^{xxvi} MEALEY'S LITIGATION REPORT, *Construction Defects*, January 2003 at <http://www.mealeys.com/stories>.

^{xxvii} *Columbine Place Homeowners' Association v. 605 Standiford Group, et al.*, No. 148630, Calif. Super., Stanislaus Co.

^{xxviii} EIFS ALLIANCE, *News/Past Articles*, February 2003 at <http://www.eifsalliance.com/articles/133.html>.

^{xxix} *Id.*

^{xxx} Ann Deering, *Beyond Sick Building Syndrome: Mold Litigation Enters the Main Stream*, RISK MANAGEMENT MAGAZINE, November 2001 at 13.

^{xxxi} No. 116331/98, N.Y. Sup.Ct., New York Co.

^{xxxii} MEALEY'S LITIGATION REPORT, Mold, Vol. 1, Issue #12, December 2001 at <http://www.mealeys.com/mold.html>.

^{xxxiii} *Id.*

^{xxxiv} *Id.*

^{xxxv} 772 A.2d 792.

^{xxxvi} *Id.*

^{xxxvii} 725 So.2d 1255.

^{xxxviii} 742 N.Y.S. 2d 314.

^{xxxix} 655 N.Y.S.2d 507.

^{xl} Greg Mazurkiewicz, *Mold Legislation to Go National* (2002) at <http://www.achrnews.com/news/cda/articleinformation/coverstory/bnpcoverstoryitem>.

^{xli} *Five Reasons Why Mold Is Not the 'Next Asbestos'* at <http://www.moldupdate.com/articles/0602k.htm>.

^{xlii} Vicki Lankarge, *Killer Mold is Nothing to Sneeze At* (2001) at <http://www.insure.com/home/mold.html>.

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to organic content, or accumulated skin flakes, small amounts of debris, etc. As to moisture, fungi cannot use humidity in the air; they need liquid water. In buildings, places where water is present, fungi will readily grow. There are many moisture sources in indoor environments, even humidity, with a temperature gradient using condensation, that can be sufficient to cause fungi to grow where water accumulates. Literally, deposited fungal spores are a garden waiting to grow.

KD: You mentioned building materials as an environment for fungi. What is new in that area?

R: People in the building materials field are starting to look at reducing the fungal spores contained in building materials, because if you add water to a surface, mold growth can occur. In a conversation I had with some colleagues in Denmark who are doing asthma research, we discussed “Just in Time Wood” as potentially creating a more favorable environment for fungi indoors. Years ago, wood was cut and then seasoned for four years, which reduced moisture content. Today, industry practices dictate that wood is cut and put in buildings in a much shorter time, say within four weeks. You can imagine the greater moisture that wood. In addition, wood is the preferred food of many fungi. Many industries are now recognizing the importance of limiting fungal growth in buildings and are researching ways to handle or treat wood and other building materials and the use of anti-microbial agents to reduce spore viability.

KD: What should designers consider, when, regarding building materials and conditions in existing buildings in order to minimize the risk of mold contamination?

R: Beyond a consideration of materials as we just discussed, controlling moisture sources and preventing condensation are critical. Thermal bridges where you might have condensation, such as pipes, corners

and air leaks where the humidity may condense are places where construction practices and vapor barriers are important. Of prime importance is the ability to fix water leaks immediately when they occur and to keep areas clean and dry.

MKD: What procedures should be followed if a mold outbreak is suspected in a building?

CR: First, do a building walk through and by visual inspection look for sources of moisture. If mold growth is found, remove any contaminated building materials possible and clean up the fungi using EPA recommended practices. Remember that mold growth can be all sorts of colors besides black; it can be pink, green, olive, brown and coral, among others. Next, reinspect the building after clean up, removal of materials, and fixing the source of the moisture. Air sampling may be informative at this point and may indicate whether spores have been released from the mold and traveled to other areas which may also need cleaning. There are two types of air sampling, one that quantifies viable spores and one that quantifies total spores. Even dead fungal spores can carry allergens and toxins, so the more critical sample in assessing exposure to fungal agents is that for the total fungal spore load. It is difficult to set limits—what is ok or not—for humans because of the variable response individuals have to fungi and a lack of good data on dose and response. As a result, I use broad categories of what indicates a potential problem or not. Because viable air sampling has traditionally been used in buildings, these guidelines are based on that type of data and it must be kept in mind that only approximately 10% of the total spore load is viable. In general, a spore concentration of all taxa of < 100 CFU/m³ is probably not a problem, but a spore concentration >1000 CFU/m³ is likely indicative of a mold problem. Any individual taxon >100 CFU/m³ is likely a problem to investigate, and >1000 CFU/m³ should definitely be investigated. In addition, since the results depend on the

conditions of sampling, various other factors must be taken into account. For example, human activity levels greatly affect airborne spore concentrations in a school setting, when children go out and then come in from recess, spore counts would be expected to be elevated.

MKD: Dr. Rogers, what is the nature of your current research?

CR: One area of ongoing research concerns exacerbations of asthma due to allergens from pollen and fungal spores in outdoor air to ascertain which types are particular problems for sensitive individuals. Another project investigates the potential impact of global climate change on the timing and abundance of airborne pollen grains. Our lab also participates in research on the impact of indoor allergen exposure, such as fungal exposure, on the development of asthma in children.

MKD: Thank you, Dr. Rogers.

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