

Title: Mold and Water-Damaged Building Materials Management Policy	Document No.: IH-004-A Revision No.: 00 Date: August 25, 2008
Nature of Change: New Procedure	

1.0 Purpose: At present, there are no explicit regulations pertaining to occupational exposure to mold in the workplace. Therefore, a building and systems management approach is generally taken that emphasizes management of water-damaged building materials before microbial content becomes problematic.

Procedures for water-impacted building materials and mold cleanup are based on exposure control objectives, the extent of contamination, site-conditions, and the sensitivity of the area. Objectives of remediation and restoration projects are to:

- Restore building conditions (repair water damage, control musty odor, restore esthetic conditions, etc.).
- Maintain buildings and utilities in a way to prevent or minimize excessive mold populations from becoming established.
- Protect extremely sensitive individuals (e.g., adverse responses in the general or known susceptible/sensitive populations).
- Evaluate each case or project on a case-by-case basis.

2.0 Scope: University wide.

3.0 Responsibilities:

Environment, Health and Safety (EH&S):

- Provide oversight and guidance as needed to assure compliance with this policy.
- Provide awareness training for employees when appropriate or warranted.
- Conduct/coordinate any air, bulk, or other sampling, if deemed necessary, and evaluate any data generated from the sampling.

3.0 Responsibilities (Con't):

Directors, Supervisors, and Managers:

- Notify EH&S of any University employee health concerns or questions pertaining to potential microbial contamination of their work environment, or when there are employee questions pertaining to the health impacts of water-impacted building materials upon their general work environment.
- Consult with EH&S whenever there are significant restorations or projects where employee health could be impacted by microbial content within the employee's work environment.
- Insure that employees who are involved in cleanup, remediation, and restoration activities are aware of and know how to comply with this policy.

Employees:

- Comply with the procedures described within this policy.
- Employees performing cleanup and restoration work must report any signs or symptoms that may indicate a reaction to mold exposure, or other agents associated with the work, to their Supervisor.

4.0 Procedures

Each project or restoration must be evaluated on a case-by-case basis. The following information provides general procedures to manage these projects.

Managing Water-Impacted Building Materials and Mold

An important goal of mold remediation is to prevent migration of contaminants into ventilation systems and adjacent building areas, especially if those areas are occupied.

Appendix A of this policy contains more detailed additional recommendations on managing water-damaged building materials from the EPA's "Investigating, Evaluating, and Remediating Moisture and Mold Problems" tables.

4.0 Procedures (Con't)

Minor Restorations in Non-Sensitive or Unoccupied area

The following minimum steps should be applied to all remediation projects, and for minor restorations in non-sensitive or unoccupied areas:

- Trace and eliminate the source of excessive moisture and mold.
- Confirm that sources of water and/or mold have been eliminated or minimized where possible before proceeding.
- If room items could become contaminated with mold spores or construction debris, remove all room items from the remediation/construction area (e.g., computer equipment, upholstered furniture, etc.) or cover/seal with plastic.
- Any building or other material that cannot be entirely dried out within 48 hours should be removed from the area and disposed of.
- Clean work area and surrounding surfaces.
 - Use a HEPA vacuum where possible.
 - Non-porous (e.g., metals, glass, and hard plastics) and semi-porous to non-porous (e.g., wood, and concrete) materials that are structurally sound and are potentially or visibly moldy can be cleaned and reused.
 - Use a mild cleaning solution and/or disinfectant, rinse well, and dry.
 - In most cases, bleach should not be used as it can damage or pit metallic and other hard surfaces, requires excessive contact time to work effectively on mold spores, and can produce strong odors.
- Building materials such as wallboard, drywall, ceiling tiles, wallpaper, and other cellulose-based materials that become wet and remain moist for more than 48 hours should be removed and replaced. This guideline also applies to materials that can house mold spores but that cannot be cleaned (e.g., damaged and contaminated fiberglass insulation and insulation wrap).
- Carpet that remains wet for more than 48 hours, or that becomes repeatedly wet due to recurrent water intrusion events, should be evaluated for possible removal. If the area is below-grade (e.g., basement work area), carpet should not be reinstalled if the area is susceptible to recurrent water-intrusion or high relative humidity levels (e.g., greater than 60%).
- Use dust suppression methods on materials that should be cut out (e.g., moisten surfaces prior to cutting-DO NOT soak the material).
- Remove mold or water-damaged materials in sealed bags or sealed containers.
- Leave area dry and clean.

4.0 Procedures (Con't)

Large Restorations in Occupied or Sensitive Areas

Additional control measures should be applied to larger projects or sensitive areas. Application of these measures must be made on a case-by-case basis:

- Plasticize critical barriers (e.g., openings to adjacent areas).
- Protect the HVAC system (e.g., sealing supplies and returns or shutting off system).
- Maintain a slight negative or neutral pressure.
- Recirculate air through a portable HEPA filter if feasible. If use of a HEPA or other portable system could disturb more dust and particles than it captures, or there is no possible discharge point away from occupied areas, it must not be used during the demolition or cleanup.
- Place a drop cloth and step-off mats outside of the work site.
- Clean off all surfaces potentially impacted by the remediation work (including areas beyond the immediate work site). Cleaning includes use of a HEPA vacuum, damp cleaning of desks or other hard surfaces where people could come into contact with released mold spores, and in other highly sensitive areas, it may also include damp cleaning of walls and ceilings to remove released materials.

Verification/Completion of Restoration

After repairs and remediation are complete, re-inspect the area after 24-48 hours to confirm conditions are acceptable.

- The supervisor and/or project manager must verify satisfactory completion for small jobs or jobs where there is little or no potential impact on University-employee health.
- The Supervisor and FP&D Project Manager should verify that large or complicated projects, or sensitive areas, have been restored to acceptable conditions.

4.0 Procedures (Con't)

Remediation Worker Protection

The following practices are **required/recommended** for employees performing the demolition/restoration work (depending upon size/extent of project-Consult Appendix A):

- Respiratory protection is strongly recommended if nuisance dusts or mold spores could be released during the demolition, cleanup or restoration steps. An N95 respirator is generally effective in minimizing exposure to nuisance dusts and microbial spores. Consult the Respiratory Protection Program requirements to determine whether medical clearance and fit testing may be required.
- Wear appropriate eye protection (safetyglasses/goggles).
- Wear disposable foot covers and appropriate disposable gloves during the remediation. Discard these items in a sealed container or bag before leaving the remediation area to prevent tracking or release of contaminated materials. Don new foot covers and gloves when you re-enter the area.
- Tyvek suits/coveralls may be appropriate to protect both the employee and to minimize spreading of dusts and contaminants outside of the worksite. If disposable protective clothing is worn, dispose of it in a sealed bag or container before leaving the remediation area.
- Wash your hands, face, and any exposed skin before leaving the area, or as soon as possible afterwards.
- Any tools or materials for re-use that may have become contaminated must be inspected and cleaned before leaving the worksite if possible, or at the earliest possible moment. Heavily contaminated items must be bagged if they cannot be decontaminated on-site.

Employees performing this type of remediation work must report any signs or symptoms that may indicate a reaction to mold exposure, or other agents associated with the work, to their Supervisor.

Microbial Sampling

Per current regulatory agency recommendations, air sampling or bulk sampling of potentially impacted surfaces materials for microbial content is not automatically required or recommended as part of the assessment or remedial process. In the event that air sampling might be necessary to provide specific information to guide remedial activities or to address specific medical and health concerns, EH&S will initiate and/or supervise this action.

7.0 Document Management

This procedure shall be reviewed once every two years, or as changes require.

8.0 Associated Documents

8.1 “Campus Commitment to Safety,” University at Buffalo, Office of the Provost, Office of the Senior Vice President, April 3, 2001.

8.2 Appendix A – EPA’s Investigating, Evaluating, and Remediating Moisture and Mold Problems (see EPA website for complete details-www.epa.gov)

9.0 Document Revision History

Revision: 00 Date of Last Revision: None Last Approval Date:

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10.0 Reason for Change

Revision	Sec/Para Changed	Change Made:	Date
00		New Procedure	8/25/08

APPENDIX A. EPA’s Investigating, Evaluating, and Remediating Moisture and Mold Problems (see EPA website for complete details)

Table 1: Water Damage - Cleanup and Mold Prevention

Table 1 presents strategies to respond to water damage within 24-48 hours. These guidelines are designed to help avoid the need for remediation of mold growth by taking quick action before growth starts. If mold growth is found on the materials listed in Table 1, refer to Table 2 for guidance on remediation. Depending on the size of the area involved and resources available, professional assistance may be needed to dry an area quickly and thoroughly.

Table 1: Water Damage - Cleanup and Mold Prevention	
Guidelines for Response to Clean Water Damage within 24-48 Hours to Prevent Mold Growth*	
Water-Damaged Material†	Actions
Books and papers	For non-valuable items, discard books and papers. Photocopy valuable/important items, discard originals. Freeze (in frost-free freezer or meat locker) or freeze-dry.
Carpet and backing - dry within 24-48 hours§	Remove water with water extraction vacuum. Reduce ambient humidity levels with dehumidifier. Accelerate drying process with fans.
Ceiling tiles	Discard and replace.
Cellulose insulation	Discard and replace.
Concrete or cinder block surfaces	Remove water with water extraction vacuum. Accelerate drying process with dehumidifiers, fans, and/or heaters.
Fiberglass insulation	Discard and replace.
Hard surface, porous flooring§ (Linoleum, ceramic tile, vinyl)	Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary. Check to make sure underflooring is dry; dry underflooring if necessary.
Non-porous, hard surfaces (Plastics, metals)	Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary.
Upholstered furniture	Remove water with water extraction vacuum. Accelerate drying process with dehumidifiers, fans, and/or heaters. May be difficult to completely dry within 48 hours. If the piece is valuable, you may wish to consult a restoration/water damage professional who specializes in furniture.

<p>Wallboard (Drywall and gypsum board)</p>	<p>May be dried in place if there is no obvious swelling and the seams are intact. If not, remove, discard, and replace. Ventilate the wall cavity, if possible.</p>
<p>Window drapes</p>	<p>Follow laundering or cleaning instructions recommended by the manufacturer.</p>
<p>Wood surfaces</p>	<p>Remove moisture immediately and use dehumidifiers, gentle heat, and fans for drying. (Use caution when applying heat to hardwood floors.) Treated or finished wood surfaces may be cleaned with mild detergent and clean water and allowed to dry. Wet paneling should be pried away from wall for drying.</p>

* If mold growth has occurred or materials have been wet for more than 48 hours, consult Table 2 guidelines. Even if materials are dried within 48 hours, mold growth may have occurred. Items may be tested by professionals if there is doubt. Note that mold growth will not always occur after 48 hours; this is only a guideline.

† If a particular item(s) has high monetary or sentimental value, you may wish to consult a restoration/water damage specialist.

§ The subfloor under the carpet or other flooring material must also be cleaned and dried. See the appropriate section of this table for recommended actions depending on the composition of the subfloor.

These guidelines are for damage caused by clean water. If you know or suspect that the water source is contaminated with sewage, or chemical or biological pollutants, then Personal Protective Equipment and containment are required by OSHA. An experienced professional should be consulted if you and/or your remediators do not have expertise remediating in contaminated water situations. Do not use fans before determining that the water is clean or sanitary.

Table 2: Guidelines for Remediating Building Materials with Mold Growth Caused by Clean Water

Table 2 presents remediation guidelines for building materials that have or are likely to have mold growth. The guidelines in Table 2 are designed to protect the health of occupants and cleanup personnel during remediation. These guidelines are based on the area and type of material affected by water damage and/or mold growth. Please note that these are guidelines; some professionals may prefer other cleaning methods.

If you are considering cleaning your ducts as part of your remediation plan, you should consult EPA's publication entitled, *Should You Have the Air Ducts In Your Home Cleaned?*(8) (see Resources List on EPA website). If possible, remediation activities should be scheduled during off-hours when building occupants are less likely to be affected.

Although the level of personal protection suggested in these guidelines is based on the total surface area contaminated and the potential for remediator and/or occupant exposure, professional judgment should always play a part in remediation decisions. These remediation guidelines are based on the size of the affected area to make it easier for remediators to select appropriate techniques, not on the basis of health effects or research showing there is a specific method appropriate at a certain number of square feet. The guidelines have been designed to help construct a remediation plan. The remediation manager will then use professional judgment and experience to adapt the guidelines to particular situations. When in doubt, caution is advised. Consult an experienced mold remediator for more information.

In cases in which a particularly toxic mold species has been identified or is suspected, when extensive hidden mold is expected (such as behind vinyl wallpaper or in the HVAC system), when the chances of the mold becoming airborne are estimated to be high, or sensitive individuals (e.g., those with severe allergies or asthma) are present, a more cautious or conservative approach to remediation is indicated. Always make sure to protect remediators and building occupants from exposure to mold.

Table 2: Guidelines for Remediating Building Materials with Mold Growth Caused by Clean Water*

Material or Furnishing Affected	Cleanup Methods†	Personal Protective Equipment	Containment
SMALL - Total Surface Area Affected Less Than 10 square feet (ft²)			
Books and papers	3	Minimum N-95 respirator, gloves, and goggles	None required
Carpet and backing	1, 3		
Concrete or cinder block	1, 3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3		
Non-porous, hard surfaces (plastics, metals)	1, 2, 3		
Upholstered furniture & drapes	1, 3		
Wallboard (drywall and gypsum board)	3		
Wood surfaces	1, 2, 3		

MEDIUM - Total Surface Area Affected Between 10 and 100 (ft²)			
Books and papers	3	Limited or Full Use professional judgment, consider potential for remediator exposure and size of contaminated area	Limited Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area
Carpet and backing	1,3,4		
Concrete or cinder block	1,3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1,2,3		
Non-porous, hard surfaces (plastics, metals)	1,2,3		
Upholstered furniture & drapes	1,3,4		
Wallboard (drywall and gypsum board)	3,4		
Wood surfaces	1,2,3		
LARGE - Total Surface Area Affected Greater Than 100 (ft²) or Potential for Increased Occupant or Remediator Exposure During Remediation Estimated to be Significant			
Books and papers	3	Full Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area	Full Use professional judgment, consider potential for remediator exposure and size of contaminated area
Carpet and backing	1,3,4		
Concrete or cinder block	1,3		
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1,2,3,4		
Non-porous, hard surfaces (plastics, metals)	1,2,3		
Upholstered furniture & drapes	1,2,4		
Wallboard (drywall and gypsum board)	3,4		
Wood surfaces	1,2,3,4		
<p>*Use professional judgment to determine prudent levels of Personal Protective Equipment and containment for each situation, particularly as the remediation site size increases and the potential for exposure and health effects rises. Assess the need for increased Personal Protective Equipment, if, during the remediation, more extensive contamination is encountered than was expected. Consult Table 1 if materials have been wet for less than 48 hours, and mold growth is not apparent. These guidelines are for damage caused by clean water. If you know or suspect that the water source is contaminated with sewage, or chemical or biological pollutants, then the Occupational Safety and Health Administration (OSHA) requires PPE and containment. An experienced professional should be consulted if you and/or your remediators do not have expertise in remediating contaminated water situations.</p>			

†Select method most appropriate to situation. Since molds gradually destroy the things they grow on, if mold growth is not addressed promptly, some items may be damaged such that cleaning will not restore their original appearance. If mold growth is heavy and items are valuable or important, you may wish to consult a restoration/water damage/remediation expert. Please note that these are guidelines; other cleaning methods may be preferred by some professionals.

Cleanup Methods

Method 1: Wet vacuum (in the case of porous materials, some mold spores/fragments will remain in the material but will not grow if the material is completely dried). Steam cleaning may be an alternative for carpets and some upholstered furniture.

Method 2: Damp-wipe surfaces with plain water or with water and detergent solution (except wood —use wood floor cleaner); scrub as needed.

Method 3: High-efficiency particulate air (HEPA) vacuum after the material has been thoroughly dried. Dispose of the contents of the HEPA vacuum in well-sealed plastic bags.

Method 4: Discard - remove water-damaged materials and seal in plastic bags while inside of containment, if present. Dispose of as normal waste. HEPA vacuum area after it is dried.

Personal Protective Equipment (PPE)

Minimum: Gloves, N-95 respirator, goggles/eye protection

Limited: Gloves, N-95 respirator or half-face respirator with HEPA filter, disposable overalls, goggles/eye protection

Full: Gloves, disposable full body clothing, head gear, foot coverings, full-face respirator with HEPA filter

Containment

Limited: Use polyethylene sheeting ceiling to floor around affected area with a slit entry and covering flap; maintain area under negative pressure with HEPA filtered fan unit. Block supply and return air vents within containment area.

Full: Use two layers of fire-retardant polyethylene sheeting with one airlock chamber. Maintain area under negative pressure with HEPA filtered fan exhausted outside of building. Block supply and return air vents within containment area.

Table developed from literature and remediation documents including Bioaerosols: Assessment and Control (American Conference of Governmental Industrial Hygienists, 1999) and IICRC S500, Standard and Reference Guide for Professional Water Damage Restoration, (Institute of Inspection, Cleaning and Restoration, 1999); see Resources List for more information