Northwestern

Water Intrusion Guide

Environmental Health and Safety

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I. Purpose

These guidelines aid in the identification, response, and mitigation of water intrusion events to prevent injuries, illnesses, property damage, and harm to the environment.

II. Scope

These guidelines apply to Northwestern schools, units, and contractors that are involved in water intrusion events at Northwestern-owned property.

III. Definitions

A. **Water category** refers to the range of contamination in water, considering both its originating source and quality after it contacts the materials at the intrusion site
   i. **Category 1** water originates from a sanitary source; it does not pose a substantial risk from dermal, ingestion, or inhalation exposure. Examples include broken water lines, tub/sink overflows with no contaminants, melting ice/snow, falling rainwater, and broken toilet tanks that do not contain contaminants or additives.
   ii. **Category 2** water contains significant contamination and has the potential to cause discomfort or sickness if contacted or consumed by humans; it can contain potentially unsafe levels of microorganisms or nutrients for microorganisms, as well as other organic or inorganic matter (chemical or biological). Examples include discharge/overflows from dishwashers/washing machines, overflows from toilet bowls on the room side of the trap with urine and no feces, and seepage due to hydrostatic pressure.
   iii. **Category 3** water is grossly contaminated and can contain pathogenic, toxigenic, or other harmful agents; it can cause significant adverse reactions to humans if contacted or consumed and can carry trace levels of regulated or hazardous materials. Examples include sewage, waste line backflows that originate beyond any trap, regardless of visible content or color, and pesticides or toxic organic substances.

B. **Water class** refers to the range of the approximate wet surface area and permeability of affected materials remaining within the drying environment at the time drying is initiated.
   i. **Class 1** is the least amount of water absorption and will likely evaporate; materials are predominantly low porosity (e.g., water is retained on the surface, little or no wet carpet or cushion).
   ii. **Class 2** is a significant amount of water absorption and evaporation load; water intrusion has flowed into the area, and wet materials are medium to high porosity (e.g., carpet, gypsum wallboard).
   iii. **Class 3** is the greatest amount of water absorption and evaporation load; water intrusion where wet, porous materials represent the majority of the combined floor, wall, and ceiling surface area in space (e.g., carpet, gypsum wall, and ceiling board).
   iv. **Class 4** is deeply held or bound water resulting in a low potential rate of evaporation after bulk water removal; affected materials are typically low in porosity or the building assemblies may require special methods, longer drying times, or substantial water vapor pressure differentials (e.g., plaster, hardwood, concrete, masonry, gym floors, structural cavities, stone, brick).

IV. Responsibilities

A. **Environmental Health and Safety (EHS)**
   i. Adhere to the requirements of this program.
   ii. Review and revise this program, as necessary.
   iii. Provide consultation and guidance, as necessary and upon request, to identify, evaluate, and control water intrusion events.

iv. Coordinate with Facilities, schools, units, contractors, and other stakeholders to facilitate water intrusion response and investigation activities, including hazardous material sampling, analysis, and abatement (e.g., mold, asbestos, and lead-containing paint), as necessary.

B. **Schools and Units**
   i. Adhere to the requirements of this program.
   ii. Promptly inform Facilities or EHS if a water intrusion event has occurred or is suspected (e.g., visible mold growth, wet carpet or ceiling tiles).
   iii. Coordinate with Facilities, EHS, contractors, and others as necessary to facilitate water event response, investigation, and remediation activities.

C. **Water and Mold Remediation Contractors**
   i. Adhere to the requirements of this program.
   ii. Coordinate with Northwestern schools, units, and others as necessary to facilitate water intrusion event response, investigation, and remediation activities.
   iii. Remove water and mold according to American National Standards Institute (ANSI) guidelines and other industry standards and best practices (refer to **Section IX – Regulatory Authority and Related Information**).
   iv. Provide qualified and adequately trained personnel with the appropriate tools and equipment, and be licensed and/or certified, as necessary.
   v. Report any unsafe conditions to Northwestern, such as structural concerns, potential mold, or wet conditions that have the potential to promote mold growth.

V. Water Intrusion Response Procedures

A. **Initial Response**
   i. All leaks and water intrusion events must be reported to Facilities Customer Service via telephone, 847-491-5021 (Evanston) or 312-503-8000 (Chicago), or email at facilities@nortwestern.edu.
   ii. In addition to the requirements of **Section V.A.i.**, contact Research Safety at researchsafety@northwestern.edu or (847) 491-5581 if water intrusion occurs in a research space (e.g., laboratory).
   iii. Ensure affected building occupants have been notified of the water intrusion event, as necessary. Prevent unauthorized personnel from entering the flooded area.
   iv. Identify and stop the source of the water intrusion (e.g., closing valves).
      a. Determine the category of the water intrusion and utilize the appropriate personal protective equipment (PPE). Refer to **Section III – Definitions.**
         1. Category 1 response PPE must include rubber gloves, boots, and basic eye protection.
         2. Category 2 or 3 response PPE must include rubber gloves, boots, disposable coveralls (e.g., Tyvek), foot coverings, and splash goggles. N95 filtering facepiece respirators can be used voluntarily in accordance with the Northwestern Respiratory Protection Program.
      b. Use plastic sheeting and cardboard to protect floors and any adjacent areas from water being transferred from the impacted zone. Spill kit equipment (e.g., pads, socks, buckets) located in mechanical rooms and hazardous waste accumulation areas, as well as sandbags positioned around campus, may be used as needed. Refer to the Storm Water Emergency Response Plan (SWERP) for sandbag locations.
      c. Incorporate the use of contractors to assist in initial cleanup measures if necessary.
   v. Track the route of water intrusion to ensure all impacted areas are accounted for and to determine if there was potential for contamination of the water along its path (e.g., traveling through hazardous materials storage areas).
   vi. Hazards

a. Identify and address any potential hazards (e.g., soggy or falling ceiling tiles, slip hazards in public areas, structural damage), such as by removing items or using barricades or tape to prohibit access.
b. If water has contacted or is presumed to have contacted any electrical equipment (e.g., conduit, receptacles), the affected area must not be entered until the energy source is locked/tagged out and verified de-energized in accordance with the Northwestern Control of Hazardous Energy (Lockout/Tagout) Program.

vii. Consult EHS to evaluate the extent of water intrusion, impact on critical buildings or areas, and potential for mold growth and other hazards as needed.

VI. Water Removal and Remediation

A. Water mitigation and restoration procedures must be performed in accordance with American National Standards Institute (ANSI) and Institute of Inspection, Cleaning and Restoration Certification's (IICRC) Standard for Professional Water Damage Restoration (ANSI/IICRC S500).
B. Water intrusion events must be remediated within 48 hours to prevent mold growth.
C. Ensure that the affected materials are not hazardous (e.g., asbestos, lead-containing materials) before removing them. Do not remove any assumed or presumed hazardous materials without testing from a qualified inspector and verification that the materials are non-hazardous. Any disturbance of asbestos- or lead-containing materials must be performed by appropriately licensed and trained personnel. Refer to the Northwestern Asbestos Management Program and Lead Management Program for more information.
D. Corrective actions for water removal and restoration depend on the class of the water intrusion (i.e., Classes 1-4). Refer to **Section III – Definitions** for definitions.
    i. Class 1 and Class 2 water intrusion events may be addressed by Northwestern personnel and/or contractors.
    ii. Class 3 and Class 4 water intrusion events should typically be addressed by a contractor.
E. Determining if a material can be dried out or must be removed is based on the porosity of the material, and its ability to be cleaned thoroughly with anti-microbial disinfectant cleaner:
    i. Non-porous materials (e.g., floor tile, metal cabinetry) can be easily cleaned with surface disinfectants.
    ii. Rugs and carpeting may be salvageable depending on their thickness. Thick wall-to-wall carpets and padding will have to be discarded or professionally treated.
    iii. Flood-soaked drywall must be removed if it's against another wet layer (e.g., insulation or baseboards), the water exposure has exceeded 48 hours, or if the drywall has been contaminated with Category 2 or Category 3 water. Drywall that is wet, but does not fit the requirements for removal, can be dried out by drilling weep holes in the base of the drywall and airing out the drywall cavity with the use of floor fans.
    iv. Anything that cannot be cleaned (e.g., soggy ceiling tiles), is too damaged, or is disposable, must be discarded and replaced.
F. The category of water intrusion can also determine the clean-up measures required for water intrusion events:
    i. For Category 1 water intrusion events, most items, porous and non-porous, are salvageable depending on their level of damage.
    ii. For Category 2 or 3 water intrusion events, all porous materials must be discarded. Use an anti-microbial disinfectant on all non-porous items affected.
G. After standing water has been removed, use dehumidifiers and floor fans to continue drying the area. If materials need to be replaced (e.g., drywall, ceiling tiles), that must occur after remediation.

VII. Mold Response and Remediation

A. Mold remediation must be conducted in accordance with ANSI/IICRC 2520.

i. For smaller mold remediation projects (e.g., <10 square feet of affected materials), remediation can be addressed by Northwestern personnel and/or contractors.
ii. For larger mold remediation projects (e.g., >10 square feet of affected materials), remediation should be addressed by a contractor.

B. While mold testing is generally not recommended or necessary, EHS may perform airborne mold spore or surface sampling if mold is suspected but not visible (e.g., odors, indoor air quality concerns). Schools and units are responsible for the cost of sample analysis.

VIII. Recordkeeping

Relevant records must be maintained in accordance with the Northwestern Incident Investigation and Indoor Air Quality Programs.

IX. Regulatory Authority and Related Information

Northwestern and its contractors will comply with the Occupational Safety and Health Administration's (OSHA) standards and any other applicable codes and standards, including:

402-K-01-00, US Environmental Protection Agency (EPA) Mold Remediation in Schools and Commercial Buildings
American National Standards Institute (ANSI)/IICRC S500-2021, Standard for Professional Water Damage Restoration
American National Standards Institute (ANSI)/IICRC 2520-2024, Professional Mold Remediation
Northwestern Asbestos Management Program
Northwestern Contractor Safety Program
Northwestern Control of Hazardous Energy (Lockout/Tagout) Program
Northwestern Incident Investigation Program
Northwestern Indoor Air Quality Program
Northwestern Lead Management Program
Northwestern Respiratory Protection Program
Northwestern Personal Protective Equipment Program
Northwestern Storm Water Emergency Response Plan (SWERP) (SharePoint)
Occupational Safety and Health Administration (OSHA) Mold Control and Clean-Up

X. Contact

For questions, contact Environmental Health and Safety at ehs@northwestern.edu.