



**Environmental
Health & Safety**

Water Intrusion and Mold Remediation Plan

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1. Program Description

The purpose of this program is to specify UCR water intrusion response procedures and guidelines for water damage and mold restoration in order to minimize bacterial and fungal growth after a water infiltration event occurs.

2. Scope

This document applies to all situations where a water intrusion event has occurred. The event may impact various building materials such as, but not limited to, flooring materials, framing network, wallboard, insulation, and ceiling components. The event may also impact documents, office and research equipment and other pieces of University property.

These procedures and guidelines in this plan have been established not only to ensure Faculty, Staff, and Student safety on campus but also to promote the preservation, replacement and/or repair of University property according to standards and recommendations contained in the Institute of Inspection Cleaning and Restoration Certification (IICRC) S500-S520 Standards and Reference Guides for Professional Water Damage Restoration and Mold Remediation.

3. Definitions

Abatement Project Notification Form: Electronic form located on the UCR EH&S website that is to be completed and submitted to EH&S prior to performing any mold abatement or hazardous materials work activity on the UCR campus or UCR satellite locations. This form can be found at the following link: <https://ehs.ucr.edu/safety>

Adenosine triphosphate (ATP) - The use of ATP as an indicator of cleanliness is a widely recognized practice. When ATP (the energy molecule found in all living cells) is present on a surface, organic residue, in the form of food or other cellular material, must be present. The presence of these organic residues creates a breeding ground for microbes.

ATP Luminometer - To measure the ATP involves a sample being taken using a surface swab or water sampling device. The test is activated, leading to a bioluminescence (emitting light) reaction taking place. The light produced by the test is measured in the luminometer and converted into Relative Light Units (RLU) for easy interpretation. The greater the RLU the ATP present therefore potential contamination risk. By setting Pass, Caution

and Fail limits for each critical control point, the user can then immediately determine if the point tested is clean or further re-cleaning is needed.

Bacteria - Bacteria are single-celled microorganisms that are ubiquitous in the environment. Under optimal conditions (i.e. temperature, moisture, available nutrients), bacteria can grow and divide extremely rapidly, and bacterial populations can double as quickly as every 9.8 minutes. The vast majority of bacteria are harmless due to the protective effects of our immune systems; however, a few pathogenic species of bacteria have commonly been found in buildings contaminated by Category 3 (sewage) water intrusions. These bacteria include species of coliforms, streptococci, clostridia, lactobacilli, micrococci, Proteus, and Pseudomonas, and are the causative agents of diseases such as: gastroenteritis, typhoid, cholera and food borne illness.

Biocides - Biocides are substances that can destroy living organisms. One of the best biocides to kill mold and bacteria is Sodium Hypochlorite (bleach). Quaternary Ammonium Chloride is another widely used biocide to control microorganism amplification. If biocides are used, always ventilate the area and exhaust the air to the outdoors. Never mix bleach with other cleaning solutions or with detergents that contain ammonia because hazardous gases could be produced. Always ensure that biocides used at UCR are EPA approved and used in accordance with EPA label requirements.

Category 1 Water - Water originating from a source that does not pose substantial harm to humans. Category 1 water is also referred to as “clean water.”

Examples of clean water sources may include, but are not necessarily limited to the following:

- Broken domestic water supply lines;
- Tub or sink overflows with no contaminants;
- Appliance malfunctions involving domestic water supply lines;
- Melting ice or snow;
- Falling rainwater; and
- Broken toilet tanks and toilet bowls that do not contain contaminants or additives.

Clean water that has contact with structural surfaces and content materials may deteriorate in cleanliness as it dissolves or mixes with soils and other contaminants, and as time elapses.

Category 2 Water - Water containing a significant degree of chemical, biological and/or physical contamination and having the potential to cause discomfort or sickness if consumed by or exposed to humans. Category 2 water is also referred to as “gray water.” Gray water carries microorganisms and nutrients for microorganisms.

Examples of gray water sources may include, but are not necessarily limited to the following:

- Discharge from dishwashers or washing machines;
- Overflows from toilet bowls with some urine (no feces)
- Sump pump failures;
- Seepage due to hydrostatic pressure;
- Chilled and condensate water; and
- Fire Protection Sprinkler Water.

Gray water may contain chemicals, bio contaminants (fungal, bacterial, viral algae) and other forms of contamination including physical hazards.

Time and temperature aggravate category 2 water contamination levels significantly. Gray water in flooded structures that remains untreated for longer than 48 hours may change to category 3 – black water.

Category 3 Water - Grossly unsanitary water containing pathogenic agents, arising from sewage or other contaminated water sources and having the likelihood of causing discomfort or sickness if consumed or exposed to humans. Black water includes sewage and other contaminated water sources entering or affecting the indoor environment. Category 2 water that is not removed promptly from the structure may be reclassified as category 3 water. Toilet back flows that originated beyond the toilet trap are considered black water contamination, regardless of visible content or color.

Category 3 water includes, but is not necessarily limited to all forms of flooding from:

- Ground surface water; and
- Rising water from rivers or streams.

Such water sources carry silt and organic matter into structures and create black water conditions.

Clearance - Is a status indicated by EH&S based on a quantitative measure of the rate at which a substance is removed from a particular site. In most cases the clearance rate is set by regulatory agencies and/or policies and procedures.

Dehumidification - Once moisture is evaporated from structural materials and contents into the air, the moisture must be removed from the air through dehumidification, or it must be externally exhausted. Failure to dehumidify may result in substantial secondary damage and present a significant health hazard.

Disinfectant - Disinfectant is a product that can be used on non-porous or porous surfaces to kill or inactivate at least 99.9% of pathogenic microorganisms but not their spores.

Evaporation - Once excess water is removed, remaining water must be changed from a liquid to a vapor by promoting evaporation. Normally, this is accomplished efficiently with specialized air-moving equipment.

Excess Water Removal - Excess water removal is essential as the beginning point of restoration procedures. Removal of excess water may be achieved by physical means such as mopping or soaking up excess moisture from hard surfaces or furnishings. However, water removal usually involves the use of more sophisticated techniques and equipment such as pumps, or specially designed commercial wet vacuuming equipment.

Floor covering evaluation - It is recommended that a determination be made as to whether floor covering materials (e.g. carpet, cushion, vinyl, wood, laminates) are salvageable. Considerations may include, but are not necessarily limited to the following:

- Construction integrity; and
- Porosity and potential health effects from contaminants.

Disposition of floor coverings and the ability to salvage them will be determined according to the appended Drying Standards.

Inspection - Following the removal of excess water, a detailed inspection must be conducted that considers the extent of water migration, the types and quantities of affected materials and the degree of apparent damage. The information obtained may be used to analyze the extent of damage and to determine the job scope. Professional testing equipment and the principals of psychrometry must be used to formulate a plan to dry and restore, or replace both structural materials and contents. A comprehensive inspection may include, but is not necessarily limited to, the following:

- Identifying and evaluating health and safety hazards;
- Determining the source of water;

- Determining the need to protect floor covering materials and contents;
- Determining the extent of moisture intrusion;
- Determining the job scope;
- Evaluating flooring materials;
- Evaluating inventories and/or contents items;
- Evaluating the HVAC system if affected;
- Assess other structural materials (walls, ceilings, etc.);
- Documenting preexisting conditions not related to the current loss (wear, urine contamination, delamination, etc.); and
- Establishing drying goals.
- Contamination;

Moisture Meter – An instrument that measures the moisture content (MC) in a variety of building materials.

Mold - Mold is a term used to designate a variety of organisms that may be found both indoors and outdoors. They are part of the natural environment and play an important role by breaking down and digesting organic material. Also called fungi or mildew, mold is part of the kingdom Fungi.

Mold can multiply by producing microscopic spores (2 - 100 microns in diameter). The number of mold spores suspended in indoor and outdoor air fluctuates from season to season, day to day, and hour to hour.

In order to grow indoors, mold needs the following three ingredients:

- Moisture:** Common sources of water or moisture include roof leaks, condensation due to high humidity, leaks in plumbing fixtures, humidification systems, sprinkler systems, and floods.
- Nutrients:** Common sources are wood, plants, soil, drywall paper and carpets
- Temperature:** Often, more than one type of mold can be found growing in the same area, although conditions such as moisture, light, and temperature may favor one species of mold over another.

When mold grows indoors, the occupants of a building may begin to report odors and a variety of symptoms including headaches, difficulty breathing, skin irritation, allergic reactions and aggravated asthma symptoms. It is important to note that all of these symptoms may be caused by other exposures or conditions unrelated to mold growth. Therefore, it is important not to assume that mold is

the cause of all these symptoms and ensure that the area is evaluated by EH&S to determine causal factors.

Mold Amplification - Is rapid fungal growth under optimum conditions (i.e., amount of free water available to mold spores for growth on a substrate) that results from the increased water activity (>24 hrs) and follows water infiltration.

Mold Awareness Training – Individuals that may come in contact with mold or that may perform small scale mold remediation (30 sq. ft. or less) or small-scale category 1 or 2 water intrusion remediation (scope defined by EH&S) shall, at minimum, participate in mold awareness training. This training is provided online by the UC Learning center (course code: RI-ESTOP0113) and provides the learner with the basic understanding of mold awareness in the workplace - how mold grows and spreads, how to recognize mold, the routes of human exposure to mold, associated health effects from mold exposure, and methods of mold prevention and clean up.

Mold Remediation/Abatement - Mold remediation includes both finding and eliminating conditions allowing mold growth. Also includes steps to safely remove mold and water damaged materials.

Monitoring - The damaged structure must be monitored starting with the initial assessment and evaluation, and continuing throughout the restoration process. Monitoring procedures may include, but are not limited to the following:

- Temperature and humidity readings;
- Updating drying progress status;
- Checking the moisture content of structural wood and other materials with a moisture meter.

When applicable, monitoring also must include checking equipment operation, work progress and indoor environment quality. Drying Standards have been developed and are presented as an appendix.

Personal Protection - Persons working in or around contaminated water during decontamination, cleaning, restoration, and biocide application must be equipped with the proper personal protective equipment (PPE) including but not necessarily limited to the following:

- Rubber gloves
- Eye protection
- Protective suit

- Rubber boots

An evaluation must be made to determine the necessity for respiratory protection. In the case of overhead hazards or contamination, hard hats must also be worn.

Pre-Renovation/Demolition Hazardous Materials Building Survey Request

Form: Electronic form located on the UCR EH&S website that is to be completed and submitted to EH&S prior to performing any construction, demolition or renovation activities on the UCR campus or UCR satellite locations. This form can be found at the following link: <https://ehs.ucr.edu/safety>

Remediation Contractor – A water damage or hazardous materials specialist contracted by UCR to set up containment around impacted areas, remove excess water and/or damaged building materials, make any necessary repairs, and ensure that impacted areas are cleaned and sanitized. These specialists should be trained and certified appropriately. At a minimum, they should be IICRC certified Water- Damage Restoration Technicians (WRT). If working with asbestos or lead materials, they must be trained and certified in accordance with DOSH or CDPH requirements, as defined in the [UCR Asbestos Management Plan](#) and [UCR Lead Compliance Plan](#).

Sampling - In general, the EPA does not recommend sampling unless an occupant of the space is symptomatic. When sampling is necessary it should be performed by a trained professional who has specific experience in designing mold-sampling protocols, sampling methods, and the interpretation of findings.

Three types of sampling include but are not limited to:

- Water Sampling:** If Category 2 or Category 3 water is suspected, water samples may be collected and analyzed for bio-contaminants such as total coliform, fecal coliform, and e-coli.
- Air sampling:** the most common form of sampling to assess the level of mold. Sampling of the inside and outdoor air is conducted and the results of the level of mold spores inside the premises and outside are compared. Often, air sampling will provide positive identification of the existence of non-visible mold.
- Surface samples:** sampling the amount of mold spores deposited on indoor surfaces. (i.e. swab, tape and dust samples)

- d. **Bulk samples:** the removal of materials from the contaminated area to identify and determine the concentration of mold in the sample.

Structural Materials - Throughout the restoration process, it is highly recommended that effort is directed toward anticipating secondary damage and attending to other structural components that may require drying, or demolition and replacement. This is especially important if water remains in contact with building materials longer than 24 hours, such as water on flooring in contact with gypsum board. These components may include, but are not necessarily limited to the following:

- Ceilings
- Walls
- Built-in furnishings and fixtures
- Insulation
- Structural wood

Temperature Control - Both evaporation and dehumidification are greatly enhanced by controlling the temperature in a confined environment. Additionally, microorganisms' growth is temperature related. Thus, temperature modification and control are an important basic principle for safe, effective drying.

Water Damage and Mold Remediation Technician Training - Individuals performing category 3 water (black water) damage restoration and mold remediation on areas greater than 30 square feet must be trained in risks of exposure and procedures for safe cleanup of these materials. It is recommended that category 2 and 3 water damage restoration and large-scale mold remediation be accomplished by IICRC certified Water- Damage Restoration Technicians (WRT), or those with similar training.

Water Intrusion - Shall be defined as any water-based liquid that is released in such a manner that it has absorbed into any building components. The components may include carpet, wood, drywall wall, ceiling tiles, or any porous materials that absorb and hold moisture. The water-based liquids shall include but is not limited to potable water, domestic hot water, reheat water, steam, steam condensation, sewage and rainwater. Liquid substances that may be classified as biological hazard shall be treated as a hazardous waste.

4. Responsibilities

4.1 Environmental Health and Safety (EH&S):

- Shall develop and implement this policy and revise as necessary;
- Shall ensure that University policies are enforced and safe work practices are used;
- Shall respond to health concerns by investigating buildings and recommending remedial action;
- Provide guidance on PPE selection for remediation operations;
- Shall assess if any life safety features are impacted from water intrusions;
- Shall determine water category and relay information to Facilities services or appropriate entity (i.e. category 1, 2 or 3);
- Shall advise whether to remove, discard and/or sanitize building materials and property according to EH&S [drying and remediation criteria](#) and provide remediation plans;
- Shall assess contaminated areas for hazardous atmosphere, flammables, corrosives, toxics, water reactive chemicals, asbestos, lead, radioactive materials, and other hazards before remediation and disposal activities begin;
- Shall perform mold and bacteria risk assessment of impacted areas, as needed;
- Shall supervise remediation and disposal activities according to Federal, State, and local regulations and institutional policies & procedures;
- Shall provide final visual assessment, clearances and reports, as necessary;
- Shall provide information pertaining to hazardous building materials, such as asbestos and lead, prior to remediation or building material disturbance.
- Shall partner with Facilities Services and/or PD&C on occupant notifications as necessary;
- Shall provide technical support to departments and employees when questions or concerns arise with regards to this policy;
- Shall review all [Pre-Renovation/Demolition Hazardous Materials Building Survey Requests](#) submitted to EH&S for the

assessment of mold and other hazardous containing materials;
and

- Shall review all [Abatement Project Notification Forms](#) submitted to EH&S prior to the start of any construction/abatement of mold containing materials.

4.2 UC Riverside Employees:

- Shall comply with this program and any further safety recommendations initialized by the supervisor/principal investigator;
- Shall conduct assigned tasks in a safe manner, wear appropriate personal protective equipment (PPE), and only use equipment for which they have been formally trained;
- Shall report any job-related injuries or illnesses, questions on health and safety, or any unsafe or unhealthy working conditions to their supervisor/principal investigator; and
- Shall contact EH&S to evaluate health and safety conditions.

4.3 Supervisors/Principal Investigators:

- Shall comply with this program and advise all employees on any further safety recommendations as applicable;
- Shall report any water intrusion or mold remediation issues to Facilities Services and EH&S;
- Shall report any job-related injuries or illnesses, questions on health and safety, or any unsafe or unhealthy working conditions to EH&S; and
- Shall wear and provide appropriate PPE and equipment necessary in order to conduct remediation activities in a safe manner.

4.4 Facilities Services and Project Design and Construction (PD&C):

- Shall notify EH&S upon discovery of any water intrusion and/or mold, see [Appendix-B EH&S Hazardous Materials Notification Process](#);
- Shall participate in advanced partnering with EH&S on all water intrusion and mold remediation activities such as: planning,

scheduling, oversight, inspections, hazard evaluations, remediation, containment set-up, monitoring, clearance sampling, occupant notification, regulatory submittals (if applicable), and coordination with consultants and contractors.

- Shall not disturb any building materials without prior authorization from EH&S or an EH&S representative (approved CAC or CDPH Lead Inspector/ Assessor) that can validate the presence of hazardous materials (i.e. asbestos and/or lead).
- Shall submit a [Pre-Renovation/Demolition Hazardous Materials Building Survey Request Form](#) to initiate EH&S assessment of mold or other hazardous containing materials;
- Shall submit an [Abatement Project Notification Form](#) prior to starting any construction/abatement of mold and/or other hazardous containing materials;
- Shall report any job-related injuries or illnesses, questions on health and safety, or any unsafe or unhealthy working conditions to EH&S;
- Shall ensure that any employees that may come in contact with mold or that may perform small scale mold remediation (30 sq. ft. or less) or small-scale category 1 or 2 water intrusion remediation (scope defined by EH&S) participate in mold awareness training.
- Shall ensure that category 3 water (black water) damage restoration and mold remediation on areas greater than 30 square feet is performed by remediation contractors with IICRC certified Water- Damage Restoration Technician (WRT) or similar training.
- Shall reduce the spread of contamination by performing preliminary liquid and debris removal from affected areas to minimize further impact;
- Shall perform preliminary sanitation in affected areas with EPA approved disinfectant;
- Shall isolate and control the source of water infiltration when necessary;
- Shall notify building occupants prior to remediation activities, in conjunction with EH&S;

- Shall, in conjunction with EH&S, determine if other building systems need to be isolated or protected;
- Shall adhere to electrical & HVAC safety protocol;
- Shall remove, discard and/or sanitize building materials and property in accordance with EH&S [drying and remediation criteria](#). Examples of impacted materials include:
 - a. Drywall/Plaster
 - b. Carpet
 - c. Ceiling tiles
 - d. Furniture/casework
 - e. Electronics/Appliances
 - f. Files/papers
 - g. Personal items
- Shall provide appropriate PPE and equipment necessary in order for employees to conduct assigned tasks in a safe manner;
- Shall perform remediation activities in accordance with Federal, State, Local regulations and institutional policies & procedures;
- Shall report to EH&S to obtain partial and/or final remediation clearances prior to re-occupancy; and
- Shall dispose of contaminated materials in accordance with EH&S Hazardous Waste protocol and applicable regulations.

5. Program Components

Water Intrusion Response

A systematized approach is essential for identifying and remediating water problems in buildings due to floods, roof leaks, potable water leaks, sewage backup, steam leaks and groundwater infiltration. The following procedures should be used for the purposes of responding to unexpected water releases from internal plumbing piping and intrusion into the building from external sources in the amount of 1 gallon of liquid or more. In the event that the water infiltration into buildings will be contaminated with hazardous materials, radioactive substances or any other life-threatening condition, abatement of those substances must occur prior to the water remediation.

5.1 Initial Water Intrusion Response

Any member of the university community who discovers a water intrusion problem or potential water problem, resulting from weather conditions or facilities damage, should follow these procedures:

1. Stay out of the area. Do not enter until electrical power has been turned off. There is an extreme danger of electrical shock if the water has contacted any electrical devices.
2. Report the leak to Facilities Services at (951) 827-4214 during normal working hours. After business hours, and on weekends and holidays, dial (951) 827-4677. You may also call the UCR Police Department to report emergency situations by calling 911 or (951)827-5222. Describe the nature of the problem.
 - a. Facilities Services or UCR PD Dispatch will ensure that proper response personnel are notified.
3. If feasible, prevent entry into the flooded area by unauthorized personnel.
 - a. Upon inspection, UCR PD, EH&S, and Facilities Services may recommend further occupant evacuation
4. Facilities Services will respond to the location, isolate, and stop leak.
5. Environmental Health & Safety (EH&S) will respond by evaluating/[monitoring](#) the extent of the water intrusion, or potential mold growth event, and make recommendations for a safe and appropriate course of action, such as containment and remediation instructions. They may also conduct pre and post water, air, surface, or bulk [sampling](#) to determine the effectiveness of the remediation measures.
 - a. See Appendix-A "[EH&S Water Intrusion Procedures](#)" for full EH&S water intrusion response guidelines.
6. EH&S and Facilities Services will determine if UCR staff can effectively remove the water and dry the area or if an outside [remediation contractor](#) needs to be employed for this service. If determined that UCR employees can effectively remove and dry the area, the following general procedures apply (see EH&S drying and remediation criteria below for specific protocol based upon building material) :
 - a. Plastic sheeting and cardboard shall be installed to protect floor coverings and adjacent areas from water that may be transferred from traffic in and out of the impacted zone.

- b. All wet materials from the area shall be dried or removed in accordance with EH&S recommendations.
 - i. Building materials shall not be disturbed without prior authorization from EH&S or an EH&S representative (approved CAC or CDPH Lead Inspector/ Assessor) that can validate the presence of hazardous materials (i.e. asbestos and/or lead).
 - c. Water from the damaged surfaces should be removed via the use of wet vacuums and floor dryers.
 - d. After the majority of water has been removed, increase the room temperature and use commercial dehumidifiers, floor fans, or exhaust fans to aid in drying in the area, in accordance with EH&S recommendations. Use drying methods in conjunction with proper containment with consideration for the direction of airflow (from “clean” to “dirty”, not “dirty” to “clean”).
 - e. After drying is complete, use appropriate detergent or biocide in accordance to the EPA label to thoroughly clean and sanitize impacted materials, in accordance with EH&S recommendations.
 - f. If building materials other than carpet have become wet, or if visible mold is observed, contact EH&S for further evaluation and moisture measurements.
 - g. EH&S will provide a final evaluation of the area to ensure that it is safe to re-occupancy.
 - h. Contact EH&S at (951) 827-5528 for disposal of any impacted building materials and plastic sheeting and cardboard or other materials used during remediation.
 - i. Move furniture back into restored area only after all remediation has been completed and EH&S has cleared the space for re-occupancy.
7. If a power outage occurs in concurrence with the water intrusion, the following steps should be taken:
- a. Turn off all light switches - The voltage may fluctuate and damage any lights that are on.
 - b. Set all equipment and appliance switches to the OFF position. This is to protect against kicking out the circuit breakers, blowing fuses, or damaging equipment when the full surge or current hits as the power comes back on.

- c. Take measures to protect equipment or experiments. Remember that air operated controls and water pressure may be affected.
- d. Increase ventilation by opening windows. If the failure lasts more than a few minutes, it will be necessary to evacuate persons from darkened areas (restroom, stairwells, or other areas with no windows or natural lighting).
- e. To prevent the Facilities Services desk from being overwhelmed with calls, only building administrators should report power outages. Facilities Services may be able to estimate the duration of the power failure.
 - i. Laboratory buildings may have to be evacuated shortly after a power outage to minimize risks to personnel resulting from inoperative fume hoods.
- f. Report all persons trapped in elevators to 911 - UCR Police Department.
- g. If it becomes necessary to evacuate the premises during a power outage, be sure to protect all valuables and make sure that all equipment is safe when the power comes back on.
- h. Upon completion of the initial response, report the incident through the [EH&S incident reporting system](https://ehs.ucr.edu/), located on the UCR EH&S website (<https://ehs.ucr.edu/>).

5.2 EH&S Drying and Remediation Criteria

The underlying principles for drying building materials during remediation are as follows:

1. The ambient conditions must be stabilized and be able to be held at normal room conditions;
2. The building materials must be returned to their equilibrium moisture content to prevent the active growth microbial spores; and
3. The building materials must be returned to their pre-loss moisture state.

Drying services shall be considered sufficient when the following three conditions have been achieved.

1. The interior ambient conditions are at or better than normal room conditions (50%RH @ 70° F);
2. The moisture in the building materials themselves will not support the active growth of microbial growth; and
3. The building materials and contents will finish returning to equilibrium with normal room conditions by themselves without further damage to them.

Campus Facility Services or Environmental Health and Safety will provide measurement of moisture in building materials.

EH&S shall determine what materials should be removed, discarded and/or sanitized according to the EH&S drying and remediation criteria. Below is a list of building materials and contents and what should be completed to preserve the integrity of the affected area(s).

Carpet:

1. Any carpet with contaminated water must be discarded under controlled conditions and the entire area disinfected with appropriate biocide.
2. Carpet that is wet less than 72 hours from steam leaks and potable water leaks can be treated per the following steps:
 - a. Remove all materials (e.g., furniture, file cabinets) from the carpet.
 - b. Extract as much water as possible from the carpet using wet vacuums.
 - c. Shampoo the carpet with a dilute surfactant.
 - d. Alternatively, follow label instructions. Soak with ¼ cup bleach to 1-gallon water solution. Maximum concentration: a solution of 1-part bleach to 9 parts water.
 - e. Rinse and extract the carpet with clean water to remove detergent/bleach residues.
 - f. Dry the carpet within 24 hours of treatment. After work is completed, increase the room temperature and use commercial dehumidifiers, floor fans, or exhaust fans to aid in drying the carpet.

Sheetrock / Drywall / Plaster / Insulation:

1. Remove and replace all water-damaged drywall/plaster and insulation if wet greater than 72 hours.
2. Drywall/plaster/insulation wet or damp by contaminated water should be disposed of immediately.
Drywall/plaster/insulation that has been previously water damaged should be monitored for mold and disposed of if wet greater than 72 hours on a subsequent water intrusion.
3. Use a moisture meter and cut sheetrock at 12 inches to 48 inches above the water mark. Note: Molds reproduce by creating hyphae that are like tentacles that grow rapidly into porous materials. The hyphae may begin growing 24 hours after the moisture levels reach growth potential from water damage or high humidity. The longer the time in days from water damage to removal, the greater the amount of drywall/plaster/insulation that should be removed (i.e., 12-48 inches above the water mark).
4. When work is completed, turn the heat up (if possible) and utilize dehumidifiers to dry the area.
5. During replacement of the sheetrock, drywall, plaster/lathe, the following general procedures are recommended.
 - a. Setup critical (air sealed) barriers to prevent airflow into clean areas or general ventilation system.
 - b. Create a negative air differential in respect to non-impacted areas where occupants may be located.
 - c. Use appropriate respiratory protection, gloves and coveralls during remediation, in accordance with EH&S recommendations.
 - d. Change and wash-up in specified area in accordance with EH&S recommendations prior to entry into non-impacted spaces.
 - e. Use work practices that minimize the amount of dust generated and mold particles becoming airborne.

Drying services on drywall shall be considered sufficient when all four of the following conditions are met.

1. The moisture content of the drywall is decreasing.
2. All affected drywall is within 10% of its normal moisture content as determined by actual measurement in a control point elsewhere in the same building. (Example: Taking

several readings in unaffected areas of drywall showed that the MC that should be expected in the building is 14%. Therefore, the maximum reading at the end of the job should be no more than 24 %.)

3. The building environment is stabilized and the existing HVAC system is capable of maintaining normal room conditions.

Hardwood Floors:

1. Remove all materials (e.g., furniture, file cabinets) from the floor.
2. Extract as much water as possible using wet vacuums.
3. Increase the room temperature and use commercial dehumidifiers, floor fans, or exhaust fans to aid in drying the floors within 72 hours of impact.
 - a. For hardwood floors impacted by contaminated water, consult EH&S regarding proper remediation procedures.

Drying services on a hardwood floor shall be considered sufficient when all four of the following conditions are met.

1. The moisture content (MC) of the wood is decreasing.
2. All affected wood is within 2.5% of its normal moisture content as determined by actual measurement in a control point elsewhere on the same floor.
3. The differential of MC in wood from the top ¼” to the bottom ¼” is no more than 1%.
4. The building environment is stabilized and the existing HVAC system is capable of maintaining normal room conditions.

Furniture/Casework:

Upholstered furniture that has become wet should be disposed. Hardwood furniture or laminate furniture where laminate is intact should be cleaned with a biocide. Laminate furniture whose laminate has become delaminated should be disposed. Furniture made of particleboard or pressed wafer board should be discarded.

Paper/Files/Records:

Remove and dispose of non-essential wet files and paperwork. The exception would be if the moisture was due to steam leaks; then these can be dried. Essential wet papers should be moved to a safe location where it can be processed to recuperate the information in a safe way with minimal cross contamination.

Ceiling Tiles:

Remove and dispose of all wet ceiling materials immediately.

Electrical Equipment:

Consider all wet wiring, light fixtures, electrical outlets to be shock hazards until it has been checked by an electrician. Shut OFF electrical power in the area(s) affected if electrical hazards are present. Appliances, computers, printers, telephones should be assessed to determine if a shock hazard is present and items impacted by contaminated water should be discarded.

5.3 Large Scale Water Loss Events and Water Loss Response Team

For minor water intrusion events, in house staff may be able to easily handle remediation operations, under EH&S guidance. For major water loss events, such as large-scale floods from water line breaks and major weather events, multiple UCR departments and entities may need to be involved on a case-by case basis. A large-scale “Water Loss Response Team” may include leadership from the following UCR Departments/Entities:

- Environmental Health & Safety
- Risk Management
- Office of Emergency Management
- Facilities Services
- UCR Police Department
- Campus Fire Marshal
- Planning, Budget and Administration Leadership
- Planning, Design and Construction
- Campus Architect

- Campus Counsel
- University Communications

5.4 Mold Remediation Procedures

Mold removal requires a strategy to deal with the cause(s) of moisture and the mold contaminants. UCR follows the Occupational Safety and Health Administration (OSHA's) guidelines for Preventing Mold-Related Problems in the Indoor Workplace.

The UCR Environmental Health and Safety Office provides technical assistance in the evaluation and mitigation of mold. Below is the EH&S campus mold abatement strategy developed to assist departments in determining abatement priorities and scope; supervising mold abatement operations; monitoring environmental and occupational mold levels before, during and after abatement; collecting and disposing of waste; and complying with applicable regulations.

Below are the steps to take during mold remediation operations:

1. Find and control the moisture source

- a. Control the moisture source. This is essential for stopping mold growth. Common sources of moisture contributing to mold growth include but are not limited to:
 - Flooding
 - Leaking plumbing fixtures, pipes, or appliances
 - Roof leaks
 - Water intrusion from outdoor irrigation
 - Unvented combustion appliances
 - High humidity
 - Condensation
 - Water collection dishes, such as refrigerator drip pans
- b. Wear personal protective equipment in line with EH&S recommendations and restrict access to the affected area if

you know or suspect the water source is contaminated with sewage or chemical or biological pollutants.

- **Important:** If flooding occurs in a lab or involves gray or black water (overflow from machines, pumps, aquariums, toilet bowls, etc.), call UCR PD at (951) 827-5222. The Campus Police will dispatch an Environment, Health & Safety (EH&S) professional.
- EH&S must give clearance before Facilities Services personnel can work in the area.

2. Clean and dry water damage promptly

- a. Clean and dry water damaged materials within 48 hours to prevent mold growth ([see EH&S Drying and Remediation Criteria](#)).
 - Maintain humidity below 60%.
 - Keep HVAC drip pans clean and flowing.
 - Do not use fans before determining that the water source is clean or sanitary.
- b. Be alert for mold growth if materials have been wet for more than 48 hours. Mold growth may have occurred — but not always.
- c. If you encounter or suspect mold growth during cleaning and drying activities, follow steps 3 through 9, below.

3. Take precautions while investigating

- a. Ensure personnel responding to work orders that may involve mold formation are trained to work safely.
- b. Take these safety precautions while investigating and evaluating mold and moisture problems:
 - Consider using an N-95 filtering face piece, gloves, and eye protection.
 - To wear an N-95 you must be respirator qualified through EH&S. See the [EH&S Respiratory Protection](#) Page for respirator qualification criteria.
(<https://ehs.ucr.edu/safety/respiratory-protection>)

- Do not touch mold or moldy items with bare hands.
- Avoid mold spores in your eyes.
- Avoid inhaling mold or mold spores.

4. Inform building occupants.

- a. When indoor mold investigation or abatement work affects building occupants, address their concerns by doing the following:
 - Emphasize the health and safety of building occupants is a top priority.
 - Demonstrate that the occupants' concerns are understood and taken seriously.
 - Present clearly the current status of the investigation or remediation efforts.
 - Identify a person whom building occupants can contact directly to discuss questions and comments about the remediation activities.
 - Consult with EH&S prior to remediation activities to define the areas of removal and provide oversight for the project.
 - Develop a project time line and communicate this with building representatives prior to the remediation and construction project. Provide contact numbers if occupants have questions about the project.

5. Determine the size of the job.

- a. Measure the affected area. The level of remediation procedures to follow depends on the size of the area involved. There are 4 levels of mold remediation.
- b. Follow the appropriate procedure level for the size of the job:
 - Level 1: 10 sq. ft. or less
 - Level 2: 10 to 30 sq. ft.
 - Level 3: 30 to 100 sq. ft.
 - Level 4: Greater than 100 sq. ft.
- c. Always inform EH&S of any mold abatement activities by submitting an [Abatement Project Notification Form](#) prior to

starting any construction/abatement of mold and/or other hazardous containing materials.

- EH&S will assist with classifying all mold remediation projects during initial project evaluation.

d. Do not disturb any building materials without prior authorization from EH&S or an EH&S representative (approved CAC or CDPH Lead Inspector/ Assessor) that can validate the presence of hazardous materials (i.e. asbestos and/or lead).

6. Level 1

- a. Use Level 1 procedures for areas 10 sq. ft. or less. Trained UCR facilities staff must perform Level 1 work. Containment is not necessary.
- b. Restrict entry to the work area to trained staff.
- c. Use personal protective equipment.
- d. Remove or clean contaminated materials:
 - Place items in a sealed waste bag.
 - Contact EH&S (951) 827-5528 for disposal.
- e. Leave the area clean and visibly free of contamination and debris.

7. Level 2

- a. Use Level 2 procedures for areas 10 to 30 sq. ft. Trained UCR facilities staff must perform Level 2 work.
- b. Restrict entry to the work area to trained staff.
- c. Use personal protective equipment.
- d. Cover the work area with plastic sheeting.
- e. Remove or clean contaminated materials:
 - Use a HEPA vacuum cleaner.
 - Place items in a sealed waste bag.
 - Contact EH&S (951) 827-5528 for disposal.
- f. Leave the area clean and visibly free of contamination and debris.

8. Level 3

- a. Use Level 3 procedures for areas 30 to 100 sq. ft. [IICRC certified Water- Damage Restoration Specialists](#) trained in handling hazardous material must perform Level 3 work.
- b. Contract Level 3 work out to professional Mold [Remediation Contractors](#).
 - Remediation Contractor shall provide written scope of work, including containment and remediation methods and use of biocides.
- c. UCR Project Managers, in conjunction with EH&S, require the contractor to do the following:
 - Restrict entry to the work area to trained personnel.
 - Vacate building occupants from adjacent areas.
 - Use personal protective equipment.
 - Cover the work area with plastic sheeting.
 - Seal ventilation ducts/grills
 - Remove or clean contaminated materials in line with [EH&S Drying and Remediation Criteria](#)
 - Use a HEPA vacuum cleaner.
 - Place items in a sealed waste bag.
 - Contact EH&S (951) 827-5528 for disposal.
 - Leave the area clean and visibly free of contamination and debris.
- d. Contact EH&S to perform post-remediation clearance [sampling](#) prior to re-occupancy

9. Level 4

- a. Use Level 4 procedures for areas over 100 sq. ft. [IICRC certified Water- Damage Restoration Specialists](#) trained in handling hazardous material must perform Level 3 work.
- b. Contract Level 3 work out to professional Mold [Remediation Contractors](#).

- . Remediation Contractor will provide written scope of work, including containment and remediation methods and use of biocides.
- c. UCR Project Managers, in conjunction with EH&S, require the contractor to do the following:
 - . Restrict entry to the work area to trained personnel.
 - . Vacate building occupants from adjacent areas.
 - . Use personal protective equipment.
 - . Seal ventilation ducts and grills.
 - . Encapsulate the work area in plastic sheeting, ventilated with negative pressurization and a HEPA filter.
 - . Use an airlocked, negative-pressure decontamination room.
 - . Remove or clean contaminated materials:
 - . Place items in a sealed waste bag.
 - . Decontaminate the outside of the waste bags.
 - . Contact EH&S (951) 827-5528 for disposal.
 - . Leave the area clean and visibly free of contamination and debris.
- d. Contact EH&S to perform post-remediation clearance [sampling](#) prior to re-occupancy

6. Reporting Requirements

Constant awareness of and respect for equipment, co-workers, and facilities and compliance with all applicable UC Riverside safety policy and procedures is mandatory.

Supervisors shall issue warnings and implement disciplinary actions up to and including termination for failure to follow the guidelines of this program.

Employees shall report any safety concerns to their supervisor or EH&S.

7. Training Requirements and Competency Assessment

Mold Awareness Training – Individuals that may come in contact with mold or that may perform small scale mold remediation (30 sq. ft. or less) or small-scale category 1 or 2 water intrusion remediation (scope defined by EH&S) shall, at minimum, participate in mold awareness training. This training is provided online by the UC Learning center (course code: RI-ESTOP0113) and provides the learner with the basic understanding of mold awareness in the workplace - how mold grows and spreads, how to recognize mold, the routes of human exposure to mold, associated health effects from mold exposure, and methods of mold prevention and clean up.

Water Damage and Mold Remediation Technician Training - Individuals performing category 3 water (black water) damage restoration and mold remediation on areas greater than 30 square feet must be trained in risks of exposure and procedures for safe cleanup of these materials. It is recommended that category 2 and 3 water damage restoration and large-scale mold remediation be accomplished by IICRC certified Water- Damage Restoration Technicians (WRT), or those with similar training.

8. Information and External References

- [American Conference of Governmental Industrial Hygienists \(AGGIH\) - Bioaerosols: Assessment and Control](#)
- [IICRC - S500 Standard and Reference Guide for Professional Water Damage Restoration](#)
- [IICRC - S520 Standard for Professional Mold Remediation](#)
- [EPA - Mold Remediation in Schools and Commercial Buildings](#)
- [OSHA - Guidelines for Preventing Mold-Related Problems in the Indoor Workplace](#)
- [NYCDH - Guidelines on Assessment and Remediation of Fungi in Indoor Environments](#)

9. Appendices

Appendix A – EH&S Water Intrusion Procedures

Appendix B – EH&S Notification Process for Water Remediation, Mold and Hazardous Material Operations

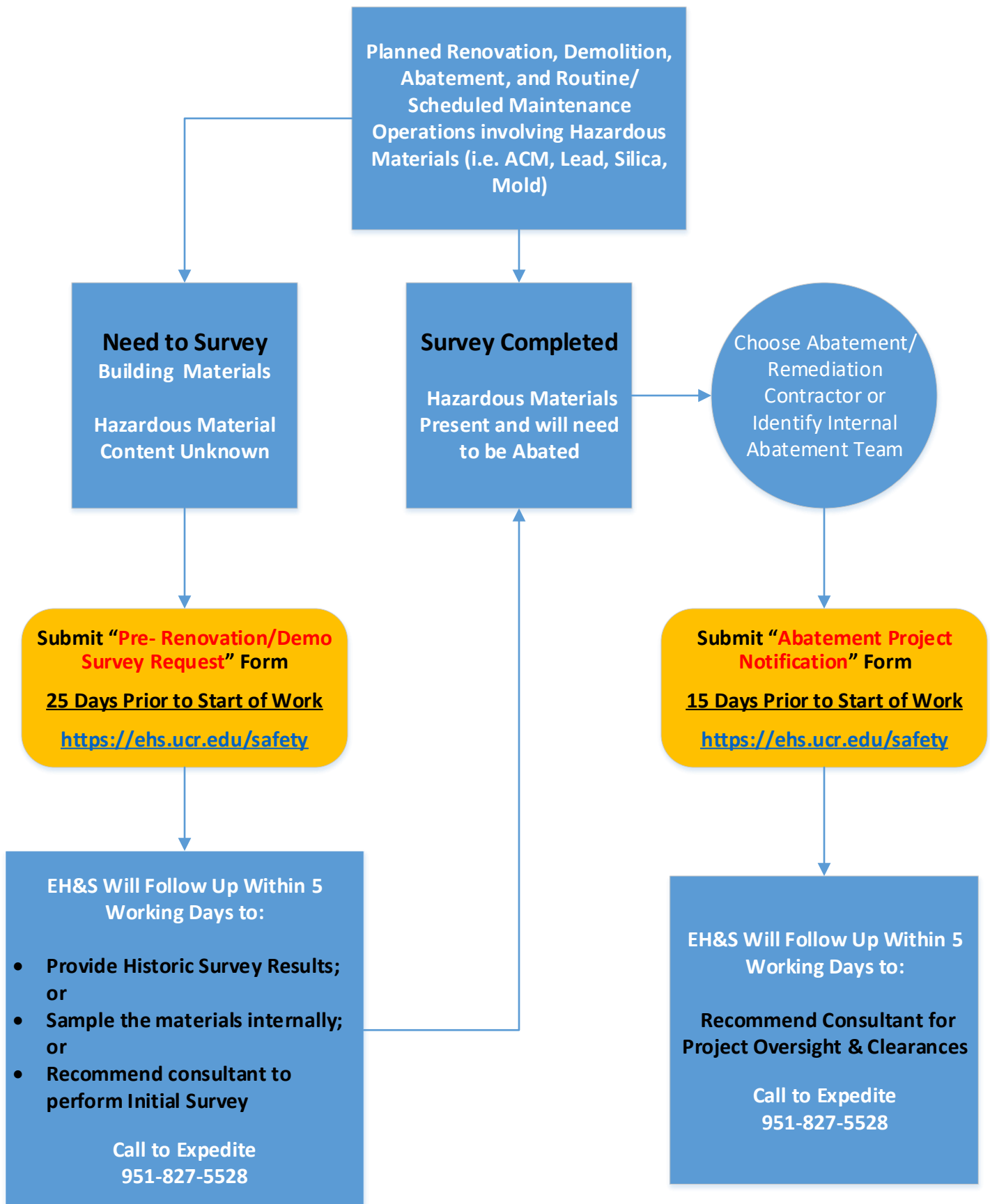
Appendix-A

EH&S Water Intrusion Procedures

1. Before responding, gather the following information regarding the water intrusion:
 - a. Location and extent of damage (i.e. multiple floors?, lab areas?)
 - b. Category of water (Cat 1 = Clean, Cat 2 = Grey, Cat 3 = Black)
 - c. Unique hazards to be aware of (i.e. spilled chemicals, electrical hazards)
2. Inform Facility Services that no building materials may be disturbed prior to asbestos and lead testing, unless assumed positive and treated as such.
3. Contact IH to review asbestos records or ask an approved third party consultant to collect samples.
4. If Hazardous Building Materials are impacted (i.e. asbestos & lead), contact Facilities Services (951) 827-4677.
 - a. For large scale asbestos abatement (over 100 Sft) a Certified Abatement Contractor must be used for remediation/abatement.
5. Bring all necessary equipment and field notes:
 - a. Water Intrusion Checklist-UCR
 - i. File Location: <\\Prodfs1.fboad.ucr.edu\EHS\Industrial Hygiene\Water Intrusion>
 - b. Moisture Meter, IR Camera
 - i. Located on South Counter of EH&S lab.
 - c. PPE, if necessary (may include protective gloves, boots, respirator, etc.)
6. Once on scene, determine if fire and life safety features are effected (i.e. fire sprinklers, egress reduction, fire barrier penetrations). If so, notify the UCR Fire Marshall (951) 827-5528
7. Assess contaminated areas for explosive atmosphere, flammables, corrosives, toxics, water reactive chemicals, asbestos, lead, and other hazards before remediation activities begin.
 - a. If Hazardous Materials/Chemicals are spilled, contact vendor for spill cleanup.
 - b. If Hazardous Waste is generated, a Hazardous Waste Manifest must be created and signed by an approved EH&S employee.
8. Advise whether to remove, discard, and/or sanitize building materials depending on water category.
 - a. Category 1 “clean water” – extract all excess water, discard and replace ceiling tiles, dispose of upholstered furniture. Dry and sanitize all porous building materials within 24 hours (porous materials = Drywall, Plaster, carpet, insulation)
 - b. Category 2 & 3 “dirty water” – Extract all excess water, discard and replace ceiling tiles, dispose of upholstered furniture. Discard and replace all porous building materials.
9. Perform mold and bacteria risk assessment of impacted areas. Request, at minimum, ATP Surface Clearances on all impacted surfaces, substrates, and supporting structures after terminal cleaning is performed.
10. The following controls are recommended for water/mold remediation activities over 30 square feet in size:
 - a. Setup critical (air sealed) barriers to prevent airflow into clean areas or general ventilation systems.
 - b. Create a negative air differential in respect to clean areas.
 - c. Use appropriate respiratory protection, gloves and coveralls for remediation workers.
 - d. Use work practices that minimize the amount of dust generated and mold particles becoming airborne.

11. Download all pictures and applicable documents (i.e. Water Intrusion Checklist) and save to a new folder on the EH&S shared drive. Title the folder with the intrusion location (i.e. File Name = Sproul Hall Room 1207).
 - a. Location to save pictures/documents to EH&S Shared Drive:
<\\Prodfs1.fboad.ucr.edu\EHS\Industrial Hygiene\Water Intrusion>
12. On the next work day following the water intrusion event, notify the Senior Industrial Hygienist of the incident.

Notifying EH&S when Hazardous Building Materials will be Disturbed for **Planned Renovation, Demolition, Abatement, and Routine/Scheduled Maintenance Operations**



EH&S Hazardous Materials Notification Process for Emergencies and Expedited Repairs

