

**A Accredited Inspection Service, Inc.**  
**6742 Forest Hill Blvd # 271, West Palm Beach,, FL 33413**  
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**Client:** Anna Morph  
**Property Address:** Ascospore # 8, Mycology FL 01010  
**Date:** 6-16-06

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## Subject Property



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**Date: 6-16-06**

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## INSPECTORS FINAL CONCLUSIONS

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INTERIOR AREAS INSPECTION  
MOLD INSPECTION  
OBSERVATIONS

The inspector observed mold in the following area(s):

Inspector observed evidence of past wide spread moisture and mold damage in the rear 1/2 of the house, most of the water damaged materials and mold had already been removed but some mold remained in several areas:

Kitchen already gutted but remediator must sand & hepa vac wood under window like opening that is left kitchen sink area, sand and hepa vac any other moldy wood in kitchen.

Dining room already gutted, sand and hepa vac moldy wood located between dining room and front living room, sand and hepa vac any other moldy wood in the area.

Rear family room already gutted sand & hepa vac moldy wood at door way and at ceiling joists, also clean visible mold from any concrete block in this and all other areas.

Master bedroom at rear of house did not appear moldy.

Master bathroom and all other rooms in the house including all the rooms at the front 1/2 of the house had not been gutted at all, all rooms and all items in the house should be hepa vacuumed.

Rear hall bathroom was not gutted but it was in the rear of the house, this is the section of the house that received lots of water intrusion & mold growth, also mold was observed in the walls of this bathroom when accessed via already opened walls in abutting rooms. Remove via professional remediation methods all wall material, ceiling material, and insulation from the ceiling and walls of this bathroom, this includes removal of attached bathroom fixtures for access to walls. Most of the remaining mold will be removed with the remediation of this bathroom.

Hepa vac all horizontal surfaces and furniture in the entire house. Discard any un needed items including in the garage.

Laundry or dry clean all clothes in the house as directed by manufacturer.

Some branch HVAC ducts were not metal thus should be replace, main trunk duct was the original metal duct but the insulation on it's outer surface was extremely moldy thus this duct should be replaced as well, replace all ducts and plenums.

Replace all insulation at the front and rear of the houses attic.

Because of elevated spore levels in the living room wall not far from the garage, and because of elevated spore levels in the living room itself remediation of the living room west most wall that separates the living room from the garage is needed, remove all drywall from the floor 4

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foot up on the entire length of this wall.

Remove all visibly moldy materials, such as mold-contaminated drywall and carpet as well as any insulation encountered. Remove at least 2 feet of material in each direction around the visible contamination. If mold is encountered behind any vapor barriers, remove, clean behind, and properly replace the vapor barrier so that the replacement barriers will keep moisture out. All heavily and even slightly visibly contaminated drywall, wallpaper, carpet and carpet padding, and other moldy porous surfaces require removal. Do not leave openings in walls, ceilings, floors, or other building components that can serve as cross contamination pathways. Do not leave openings that can result in the entrance of humidity or other outdoor elements into the containment area from outdoors, crawl spaces, or attic areas. Double bag moldy debris, or wrap moldy debris in sheets of 6 mil plastic. Tape shut then, hepa vac or wet wipe exterior of bags, and dispose as normal waste unless prohibited by local regulations.

**MOLD INSPECTION**  
**ENVIRONMENTAL READINGS**

Moisture testing was conducted with a moisture meter, and the moisture meter detected no unusual moisture levels in the areas tested.

Indoor humidity at the area and time of testing was: 57 %RH, at 89 F this appears satisfactory but when we consider the high temp indoors we will realize that humidity readings are misleading in such hot environments, so we have to measure grains of moisture, grains of moisture were 119 grains, this is high. A dehumidifier is needed.

Outdoor humidity was: 55 %RH at 89 F

According to the U.S. Environmental Protection Agency guide entitled Mold Remediation in Schools and Commercial Buildings, indoor humidity should be maintained below 60% relative humidity, ideally 30-50% RH, if possible.

Building pressurization was neutral when tested with a smoke pen, this is typically considered satisfactory in residential buildings such as this, but remediation was being preformed and no negative pressure was observed in the work areas. Negative pressure of around 5 or more pascals should be maintained in the work area until passing clearance testing.

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MOLD INSPECTION  
CONCLUSIONS

Inspection / post remediation verification failed because approximately the rear 1/2 of the house was being remediated, but air scrubbers were not utilized, negative pressure and containment were not maintained, HVAC system openings and openings made in walls were not blocked with plastic sheeting, also a dehumidifier should be provided, spore suppression of any type was likely not utilized, furniture and clothes were removed from the work areas, but were placed in nearby rooms and were not covered in 6 mil plastic sheeting to protect them from cross contamination with spreading mold spores. Also spore levels were elevated in various areas.

The only equipment observed at the site was a common household fan and this fan will not aid in drying the house out, nor will it remove spores like a air scrubber, the fan observed to be in use will only manage to stir up settled spores and move humidity from point a to point b without removing it from the air.

In addition to the above mold growth was observed in various areas of the house, primarily on the back sides of the hall bathroom walls, these walls were observed from the abutting bedroom, and the abutting kitchen, as the walls were open in these two rooms. Mold was also observed in the insulation in the attic, this inspectors experience with insulation after hurricanes is that it often traps moisture under it and hidden mold is common under insulation in attics.

If professional mold removal also known as mold remediation is needed, then information on mold removal will be in the remediation section of the report. Other general conclusions and important information can be found in various other parts of this report. This is just a summary of the inspector's findings. It is very important that you read the entire document.

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**Client Name:** Anna Morph  
**Inspection Address:** Ascospore # 8, Mycology, FL 01010  
**Today's Date:**

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## SITE INFORMATION

### CLIENT AND SITE INFORMATION:

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REPORT NUMBER: 0000247.

INSPECTION DATE: 6-16-06.

CLIENT NAME: Anna Morph.

INSPECTION SITE  
STREET ADDRESS: Ascospore # 8.

CITY/STATE/ZIP: Mycology, Florida 01010.

CLIENTS MAILING  
ADDRESS: bettyglucans@chitin.com

CLIENTS E-MAIL  
ADDRESS: 100X Objective Oil Emersion Fl 10101.

CLIENT PHONE  
NUMBER: 10101010.

BUILDING TYPE: home.

### General Mold Inspection limitations and disclaimer.

***Do not depend on your mold inspector for any medical advice; that is the job of a medical specialist. If any illness is experienced that may be related to mold or other indoor environmental factors, then a family doctor should be consulted regarding health complaints. In addition, the unhealthy person should obtain a referral to the appropriate medical professionals specializing in allergies, environmental medicine, or occupational health, as prescribed by the physician. If building related symptoms, such as allergy or asthma-like symptoms or other similar symptoms are experienced, then a mold investigation is often the logical starting point in an effort to locate, define and control the problem as mold is often the culprit. One must keep in mind that occasionally other bioaerosols can result in symptoms or illness as well. This inspection is not intended to sample or report on what the inspector considers to be typical tiny amounts of expected mold. Unless arrangements are made and agreed to in written form and paid for, this is not an environmental investigation for conditions, such as dust mite, roach, and pet allergens, virus, bacteria, lead-based paint, asbestos, radon, voc's or any other environmental conditions. This is not a wood destroying organism or termite inspection report for dry rot fungus or other fungus that causes wood decay. This is a mold inspection only. The inspector does not offer an opinion as to the advisability of the purchase or sale of property. Unless you pay for and request mold sampling in every room, inner wall stud bay, AC duct, carpet, and all other surface in all areas, then items tested and sampled during this standard mold inspection will be randomly tested and sampled. Environmental testing equipment when used are used in representative or random areas and each and every area of the property is not checked with such devices due to time constraints. Inspector is not responsible or liable for the non-discovery of any water damage, water problems, mold contamination, mold problems or other conditions of the subject property,***

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*or any other problems which may have developed or become more evident after the inspection and testing time and date. Inspector is not responsible for or liable for the non-discovery of any, water problems, mold contamination, or any other problems that were not discovered due to inadequate sampling in specific areas where sampling was not requested and paid for or where no readily visible clues existed that would have warranted sampling in those areas. Your inspector is unlikely to sample for, or locate mold which may be hidden inside walls, behind wall paper, appliances, furniture or other inaccessible areas.*

## **QUALIFICATIONS OF INSPECTOR**

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### **QUALIFICATIONS OF INSPECTOR**

*Daryl Watters is a CIE Certified Indoor Environmentalist Certified By The Indoor Air Quality Association*

*Daryl Watters is a certified mold inspector certified by 1) The Certified Mold Inspectors and Contractors Institute, and 2) Environmental Assessors Association, and 3) Environmental Solutions.*

*Daryl Watters is certified in home inspections by the National Association of Home Inspectors. And is a member of the National Association of Mold Professionals, the Indoor Air Quality Association and the National Association of Home Inspectors.*

*Our mold investigations are generally performed by relying heavily on visual inspections for visible mold and air sampling for quantitative analysis of mold spore levels at the property in question.*

*This mold investigation report was compiled using current acceptable environmental hygiene standards with influences from the following organizations. Indoor Environmental Standards Organization, The American Conference of Governmental Industrial Hygienists, and The New York City Department of Health & Mental Hygiene Bureau of Environmental & Occupational Disease Epidemiology Guidelines on Assessment and Remediation Of Fungi in Indoor Environments.*

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## **HISTORY AND INTERVIEWS**

**PROPERTY HISTORY** The following is the information given to the inspector regarding the subject property. Such interview information is used to guide the inspectors investigation.

**INTERVIEWS** Property was severely water damage by hurricane Wilma last fall, the hurricane severely damaged the rear 1/2 of the roof and the rear 1/2 of the house was badly wetted for an extended period of time prior to roof repairs.

### **GOALS AND**

**OBJECTIVES:**

To help determine if remediation appeared to be satisfactory.

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## **MOLD REMEDIATION PROTOCOL**

**Professional mold removal (remediation) is recommended. Give your remediator this report, it includes information on specific areas in need of mold removal, and also recommended methods for mold removal.**

**Phone numbers of remediators we recommend, if any, will be listed on the next page. You should feel free to shop around on your own for a qualified remediator.**

### **DISCLAIMERS APPLICABLE TO CONSULTANTS**

It is the responsibility of the consultant using this protocol to update it as needed so it complies with the most current technical standards on remediation and the most current regulations and laws, which are applicable to remediation and the building trades. The consultant using this mold remediation protocol must modify and update it accordingly with each remediation job prescribed so that it is applicable to the specific remediation job that the protocol is to be used on.

After modification by the consultant, this document is to be used only by trained, certified, and where applicable licensed remediators only. It is offered without warranty, either expressed or implied, as to the merchantability, fitness for a particular purpose, or any other matter. Following the specification does not ensure compliance with any federal, state or local regulations, nor safe or satisfactory or complete performance of remediation. This remediation protocol must be modified in various sections by the person acting as a qualified indoor environmental professional, inspector, or industrial hygienist, to accurately account for unique remediation requirements in the property being remediated. It is strongly recommended that consultants using this general protocol consult with their legal or technical advisors prior to use.

### **DISCLAIMERS APPLICABLE TO CLIENTS**

This protocol was prepared under the constraints of time and scope, and it reflects a limited investigation and evaluation. Further analytical testing may be required to find additional hidden mold infestations in hidden areas not sampled or inspected. Inspections by other specialists may be required to locate possible contamination from asbestos, lead paint, and other environmental hazards prior to remediation. The presence of such materials take precedence over mold remediation and removal of such regulated materials must be conducted in accordance with federal, state, provincial and local laws and regulations and require specific remediation protocols. The results of this analysis represent conditions only at the exact time and locations from where samples were taken. Thus, the report and this remediation letter should not be relied on to represent conditions at any other location or date and does not imply that this property is free of contaminants in other areas. The general mold remediation protocol template was created using current acceptable environmental hygiene recommendations as defined by The Institute of Inspection Cleaning and Restoration Certification (IICRC), the New York City Department of Health & Mental Hygiene Bureau of Environmental & Occupational Disease Epidemiology, the American Conference of Governmental Industrial Hygienists, National Air Duct Cleaners Association, and other remediation techniques that are acceptable and used by professional remediators.

### **PROPERTY INFORMATION**

Information on areas sampled and the laboratory analyses of the mold samples are attached to this

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protocol and includes information in regards to mold spore concentrations, types of molds sampled by scientific genus name, locations of molds sampled and information on visual inspection findings, moisture meter survey, and humidity levels.

## **MOLD REMEDIATION RECOMMENDATIONS:**

### LOCAL REMEDIATORS

#### **LOCAL REMEDIATION FIRMS THAT HAVE DONE A GOOD JOB FOR OUR PAST CLIENTS ARE LISTED BELOW**

Be Very Careful When Choosing A Remediation Firm. There Are Few Regulations In Most States.

Your Remediator Should:

Have No Conflict Of Interest.

They Should Be Certified, Insured, Professional, And Experienced Remediators, Who Use Updated Equipment And Methods. They Should Go Over Contracts Outlining Your Obligations, And The Remediators Obligations. Your Remediator Should Follow National Standards For Remediation. Last But Not Least They Must Possess Any And All Required Licenses Whenever Applicable.

**Abestex (Manny Perez) 954-969-0780**

**Advanced Restoration (Paul ) 305-481-4885**

**Duct Busters (Joe Duval) 954-427-8326**  
**Air conditioner and duct remediation specialist**

**Air Duct Aseptics (Michael Tebor) 888-707-7763**  
**Air conditioner and duct remediation specialist.**

### MOISTURE CONTROL

#### **MOISTURE REMOVAL**

**Extremely important:** Prior to any remediation, always correct all conditions that have contributed to excess moisture or humidity at the property. Extract any excess water from the property, and remove excess humidity with a professional dehumidifier. Humidity must be maintained between 30% and 50% in the work area. Your inspector is not responsible for mold that returns after remediation due your failure to have any and all required humidity and moisture repairs completed.

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## GUIDELINES

### **RECOMMENDED GUIDELINES**

Remediators should perform remediation in compliance with the Institute of Inspection Cleaning and Restoration Certification (IICRC) mold removal guidelines, The New York City Department of Health & Mental Hygiene Bureau of Environmental & Occupational Disease Epidemiology guidelines or in compliance with EPA mold removal guidelines for schools and commercial buildings. Air conditioner remediation should be done by a licensed AC contractor who specializes in cleaning mold contaminated HVAC systems. HVAC remediation work should be done in compliance with NADCA recommendations. The remediator should follow any applicable recommendations that the indoor environmental professional included below.

### **CONTRACTOR RESPONSIBILITIES**

Remediation services should be rendered only by a professional, experienced, mold remediator who can verify the following: proper insurance coverage, proper certifications in mold remediation by a non-profit organization (such as IICRC, or Amlaq,) and possesses any licenses required in your area. All work shall be done in strict accordance with all applicable regulations, standards, and codes.

It is highly recommended that the remediator use a legal written contract which outlines the contractor's responsibilities and client's obligations as well as cost estimates, limitations and disclaimers. The agreement must be made prior to remediation regarding who is responsible for build-back of building materials after moldy building materials have been removed. All personal property removed by the remediator shall be returned to their proper locations after remediation is complete.

Employees must demonstrate completion of mold remediation training and respirator training. Employees must demonstrate hazardous communication training as required by the US Occupational Safety and Health Administration (OSHA 29 CFR 1910.1200). Tyvec coveralls should be utilized along with proper gloves, goggles, and foot cover. NIOSH-approved respirators and cartridges are highly recommended. Adequate respiratory protection must be utilized in accordance with OSHA 29 CFR 1910.134. In addition, the extent of coverall use and selection of respirator type and selection of containment type at this specific job site must comply with the mold removal guidelines prescribed by New York City Department of Health & Mental Hygiene Bureau of Environmental & Occupational Disease Epidemiology.

The remediator shall use all appropriate controls and work practices which are standard in the indoor air environment and mold remediation industry that apply, regardless of the inclusion or exclusion of such standards in this document. Should the above scope or protocol or any part thereof not be specifically adhered to, the consultant and mold inspection company shall be held harmless by all parties.

### **CONTAINMENT**

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The containment enclosure will be in the form of 6 mil thick polyethylene sheeting. The remediator shall enclose in 6 mil polyethylene sheeting any and all HVAC system returns and air vents, and any ceiling voids above ceiling tile in the containment area that are used as return air plenums. Also, all conduits, chases, risers and doors within the containment area shall be sealed with 6 mil plastic to minimize the migration of contaminants to other parts of the building. It is highly recommended that warning signs be posted that inform persons that mold remediation work is ongoing. In addition, it is highly recommended that remediators restrict access to the work areas. Pressure in the containment enclosure must be negative at least 5 pascals or 0.02 inches water gauge relative to non contaminated areas outside of the containment enclosure. Contractors can verify negative pressure with a digital manometer. It is highly recommended that containment barriers be constructed so that containment flaps close if negative pressure is lost. In addition to the creation of negative pressure, it is highly recommended that a containment area achieve four to twelve air changes per hour for containment air ventilation and dilution. Air being removed from the containment enclosure should be HEPA filtered and emptied outside, away from air intakes. If it is not possible to exhaust air outside, the air must be HEPA filtered and a particle counter should be utilized to confirm proper function of the filter. Air scrubbers equipped with HEPA filters and capable of at least 600 to 1,000 cfm must be used in all enclosed work areas during remediation and for at least 48 hours after remediation. Expanding containment may be necessary when hidden fungal contamination is discovered. The creation of negative pressure differentials may create a risk of carbon monoxide exposure from back drafting of carbon monoxide, or fire hazards due to rollout of fire from gas appliances. Caution, judgment, and proper planning must be used whenever gas appliances, fireplaces, laboratory hoods and other potential pathways which may be affected by the creation of nearby negative pressure. Negatively pressurized containment in hot humid climates or seasons can cause humidity to be sucked into containment areas through openings in walls, ceilings, and floors.

#### **HVAC SYSTEM SHUT DOWN**

Any air conditioner in the enclosed work area or with a return in the enclosed work area must be shut down, locked out, and all registers, grills, and returns must be sealed and taped with barriers consisting of polyethylene sheeting. Supplemental portable heating or air conditioning may be used in the building or work area if needed to maintain favorable temperatures for workers and building occupants.

#### **REMOVAL OF PERSONAL ITEMS**

All furniture, clothes, mirrors, and other personal items must be removed from the work areas and stored in a safe, dry place. Removal will deter cross contamination and will almost always expose hidden mold behind personal items. Hard-surfaced personal items that were in contaminated areas must be wiped with fungicide. Porous items in same areas must be HEPA vacuumed or

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disposed of. All non-movable and attached items in the work area shall be sealed with polyethylene sheeting after being first HEPA vacuumed and then wet wiped with fungicide, exercise caution when wrapping salvageable items to prevent trapping moisture.

#### **SPORE SUPPRESSION**

Prior to removal and disposal of any moldy materials, spore suppression is recommended. Spore suppression can be in the form of HEPA vacuuming moldy surfaces, covering moldy materials with sticky sheets of plastic covering, or simply spraying the moldy material with a misting of fungicide. Only EPA-approved fungicides should be used, such as a products manufactured by Fiberlock or similar companies.

#### SPECIFIC MOLD REMOVAL RECOMMENDATIONS

#### **MOLD REMOVAL**

The inspector observed mold in the following area(s):

Inspector observed evidence of past wide spread moisture and mold damage in the rear 1/2 of the house, most of the water damaged materials and mold had already been removed but some mold remained in several areas:

Kitchen already gutted but remediator must sand & hepa vac wood under window like opening that is left kitchen sink area, sand and hepa vac any other moldy wood in kitchen.

Dining room already gutted, sand and hepa vac moldy wood located between dining room and front living room, sand and hepa vac any other moldy wood in the area.

Rear family room already gutted sand & hepa vac moldy wood at door way and at ceiling joists, also clean visible mold from any concrete block in this and all other areas.

Master bedroom at rear of house did not appear moldy.

Master bathroom and all other rooms in the house including all the rooms at the front 1/2 of the house had not been gutted at all, all rooms and all items in the house should be hepa vacuumed.

Rear hall bathroom was not gutted but it was in the rear of the house, this is the

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section of the house that received lots of water intrusion & mold growth, also mold was observed in the walls of this bathroom when accessed via already opened walls in abutting rooms.

Remove via professional remediation methods all wall material, ceiling material, and insulation from the ceiling and walls of this bathroom, this includes removal of attached bathroom fixtures for access to walls. Most of the remaining mold will be removed with the remediation of this bathroom.

Hepa vac all horizontal surfaces and furniture in the entire house. Discard any unneeded items including in the garage.

Laundry or dry clean all clothes in the house as directed by manufacturer.

Some branch HVAC ducts were not metal thus should be replaced, main trunk duct was the original metal duct but the insulation on its outer surface was extremely moldy thus this duct should be replaced as well, replace all ducts and plenums.

Replace all insulation at the front and rear of the houses attic.

Because of elevated spore levels in the living room wall not far from the garage, and because of elevated spore levels in the living room itself remediation of the living room west most wall that separates the living room from the garage is needed, remove all drywall from the floor 4 foot up on the entire length of this wall.

Remove all visibly moldy materials, such as mold-contaminated drywall and carpet as well as any insulation encountered. Remove at least 2 feet of material in each direction around the visible contamination. If mold is encountered behind any vapor barriers, remove, clean behind, and properly replace the vapor barrier so that the replacement barriers will keep moisture out. All heavily and even slightly visibly contaminated drywall, wallpaper, carpet and carpet padding, and other moldy porous surfaces require removal. Do not leave openings in walls, ceilings, floors, or other building components that can serve as cross contamination pathways. Do not leave openings that can result in the entrance of humidity or other outdoor elements into the containment area from outdoors, crawl spaces, or attic areas. Double bag moldy debris, or wrap moldy debris in sheets of 6 mil plastic. Tape shut then, hepa vac or wet wipe exterior of bags, and dispose as normal waste unless prohibited by local regulations.

**INSPECTION FOR PREVIOUSLY HIDDEN MOLD**

Once the wall board or other moldy material is removed, the exposed areas must be inspected for mold growth on previously hidden surfaces, such as wall studs, pipes, conduits, and wall board materials which are located behind the studs. Any previously hidden mold now exposed must also be removed while

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retaining building structural integrity, enclosure integrity, and negative pressure. Upon removal, moldy materials are to be double bagged, sealed with tape, removed from the property and disposed of.

#### **CLEANING OF COMPONENTS INSIDE THE WALL CAVITY**

Non-removable, contaminated wooden materials (such as studs inside walls) must be sanded down at least 1/16th of an inch to remove mold prior to fungicidal treatment. Contaminated metal studs must be cleaned with a detergent solution and treated with fungicide. If it is not possible to clean and disinfect the structural item, then it must be removed, disposed of and replaced. Structural supporting members may need the consultation of a structural engineer prior to removal and replacement. Sand or wipe away mold from the top, bottom, front, back, and sides of items. Don't forget mold in tight crevices. The above approach to covering all surfaces must also be utilized when applying fungicide.

#### **CLEANING THE WORK AREA**

Micro clean the rest of the areas in the contained area by HEPA vacuuming all surfaces from top to bottom, and in the direction from least contaminated area towards more contaminated area. Next, wipe all surfaces in the work area with an antimicrobial disinfectant. Wipe all electrical components such as wires and sockets with the electrical power off. Only EPA-approved fungicides should be used. Do not use bleach since it is not an EPA-approved fungicide, and will often cause corrosion if applied on metal. When clean the work area should be free of the following: clutter and debris, moisture, humidity above 60%RH, musty or moldy odors, dust, mold growth, and spore levels above normal background levels.

#### **CLEANING CLOTHES AND OTHER PERSONAL BELONGINGS**

It is recommended that most cleaning processes start and end with HEPA-vacuuming.

**CLOTHES** Machine wash safe clothes from contaminated areas can be washed as directed on clothing label, or dry cleaned. If manufacturer's label permits then laundry sanitizes can be used to reduce odors and microorganisms.

Bleach can be used with white fabrics if permitted by manufacturer's label. Non-bleach safe fabrics should be washed with color safe bleach products such as those containing sodium perborate or sodium percarbonate if permitted by manufacturer's directions.

Washing your machine safe clothing may also be enhanced by increasing water temperatures, but be careful not to exceed manufacturer's water temperature recommendations.

If heavily contaminated, disposal is advised with client's written permission.

**LEATHER ITEMS** Clean lightly contaminated leather items with a leather soap and treat with a fungicide that has been tested and proven to be safe on such items.

If heavily contaminated, dispose of them with clients written permission.

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**FURNITURE** Lightly-contaminated, fleecy furniture with no moisture damage can sometimes be HEPA vacuumed. If visually contaminated with mold or previously wet and stained, disposal is typically advisable. Any items disposal should be done only with the client's written permission. Contaminated, non-porous items should be cleaned with a detergent solution and treated with fungicide when testing has demonstrated that the surface will not be damaged or discolored by the fungicide to be used. Remediation of high value items such as fine is to be conducted by qualified, experienced specialists familiar with the types of items being restored.

## POST REMEDIATION VERIFICATION

### **MACHINES OFF**

Turn off any dehumidifiers, negative air machines, and air scrubbers at least 24 hours prior to post remediation verification testing.

### **RE-INSPECTIONS**

Prior to the removal of containment or the installation of new building materials, call your mold inspector for post remediation verification testing and inspections to determine if mold remediation appeared to be successful.

You will be charged a fee for this re-inspection.

## HVAC REMEDIATION RECOMMENDATIONS

### AIR CONDITIONER REMEDIATION

#### **HVAC SYSTEM REMEDIATION**

Inexpensive, quick cleaning may cause more problems than it solves by stirring up spores in the duct work, or by leaving many fragments of mold in the coils and blower fan. Obtain complete and professional remediation services from a professional HVAC contractor specializing in decontamination of moldy HVAC systems who will perform remediation in compliance with NADCA ACR 2002 which is incorporated by reference. If available, more recent NADCA recommendations should be used.

#### **CLEAN THE FAN**

Remove and clean the blower fan.

#### **CLEAN THE COILS**

Very carefully clean the coils, especially the bottom ( in most cases, they may have to be removed for cleaning due to contamination growing on the bottom sides of the coils and between the coils fins.) If satisfactory cleaning cannot be achieved without damaging the coils, then replacement of the coils is recommended.

#### **CLEAN THE PAN**

Clean the condensation drain pan and lines.

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**CLEAN THE INTERIOR**

Remove all contaminated insulation from inside the air handler. HEPA vacuum, clean, and sanitize the interior components with a fungicide approved by the EPA for use inside air handlers.

**REMOVE THE DUCTS**

Remove all sections of the ducts system, some of the ducts were metal and typically could be cleaned, but in this case the insulation on the exterior of the metal ducts was very heavily contaminated with mold growth as depicted in included photos.

**CLEAN AROUND THE AC**

Properly remediate any microbial growth on carpets, wood, drywall, or other surface located above, around, and under the air handler and it's enclosure. Do this in compliance with nationally recognized mold remediation guidelines and any state or federal requirements that may apply.

**RE-INSTALL**

Re-install or replace fan, coils, insulation, panels, screws, filters, and other parts previously removed. Check for and repair any duct leaks, refrigerant leaks, or condensation leaks. Finally, make sure system is cooling properly.

**RE-INSPECTIONS**

Prior to the removal of containment or the installation of new building materials, call your mold inspector for post remediation verification testing and inspections to determine if mold remediation appeared to be successful.

You will be charged a fee for this re-inspection.

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## EXTERIOR FACTORS

### Exterior inspection limitations and disclaimer

*Your inspector is a mold inspector and may not be qualified as or acting as a home inspector, general contractor, structural engineer, synthetic stucco inspector, or a specialized leak detection expert . Your inspector does not necessarily inspect conditions on roofs and roof eaves. Areas typically not visible including flashings, high walls, 2nd floor windows and other areas above eye level are typically inaccessible for inspection. For a detailed analysis of the condition of roofs, exterior siding, the presence of synthetic stucco or siding defects, window caulking deterioration, deck connections, and other features that may result in water intrusion into your property, consult with qualified, licensed specialist in the appropriate fields.*

### EXTERIOR

#### CONDITIONS

#### EFFECTING OUTDOOR

#### SAMPLE RESULTS:

Outdoor areas were clear & free of rainy conditions at time of inspection that would affect air sampling. Outdoor areas were clear & free of windy conditions at time of inspection that would affect air sampling.

#### WALLS MATERIALS:

Exterior wall covering appeared to be composed primarily of stucco. Exterior wall structure appeared to be composed primarily of block.

#### WALL CONDITION:

Upon inspection of the exterior walls, and a representative number of windows and various other attachments, the inspector observed no obvious visible conditions that would result in likely water intrusion.

#### WINDOWS:

Observed no readily visible problem conditions at the window such as bad caulking that would cause moisture intrusion.

#### ROOF COVERING

#### MATERIAL:

shingle.

#### ROOF CONDITION:

Roof has been replace, this mold inspector observed no obvious visible conditions that would indicate serious problem conditions with the roof at time of inspection, however this is a mold inspection and not a roof inspection. This inspection does not involve walking the roof. For more in-depth information regarding the condition of this roof, consult a roof inspection report.

#### GRADING:

Inspector observed no evidence of serious grading problems that would result in water intrusion during normal rain.

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## **EXTERIOR**

### **CONCLUSIONS**

After a detailed visual inspection in all accessible exterior areas that were to be inspected, no major defects were observed that appeared to be an immediate threat in regards to causing moisture intrusion problems or mold problems. The exterior inspection was satisfactory.

Roof are not walked as this is a mold inspection and not a roof inspection.

Caulking at 2nd Floor windows is not checked, and this is not an inspection of synthetic stucco / EFIS systems.

## **EXTERIOR DIGITAL PHOTOGRAPHS**

### **PHOTO**

Serious mold problems should come as no surprise in a climate where escaped 3 foot long iguana lizards reside in the rear yard.



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## INTERIOR AREAS INSPECTION

### Interior inspection limitations and disclaimer

*No destructive or disruptive testing or assessment will be performed. Opening of walls, lifting of carpets, removal of ceiling panels, insulation, and vapor barriers will not be conducted. The inspector will not check any area that poses a safety threat to the inspector such as walking on roofs. A roof inspector should be consulted in regards to any roof concerns. Attics and crawl spaces with low clearance are not entered. The client understands and agrees that inspection and testing can report only on problems that were present at the time of testing and inspection. The inspector cannot report on areas or locations in the building that have not been specifically inspected and tested. Hidden mold that displays no clear warning signs of it's presence will most likely not be detected. Appliances, furniture, office equipment, and other personal items are not be moved during this inspection.*

## MOLD INSPECTION

### OBSERVATIONS

See remediation section of this report, it includes visual observations and also remediation ( mold removal recommendation).

## MOLD INSPECTION

### ENVIRONMENTAL READINGS

Moisture testing was conducted with a moisture meter, and the moisture meter detected no unusual moisture levels in the areas tested.

Indoor humidity at the area and time of testing was: 57 %RH, at 89 F this appears satisfactory but when we consider the high temp indoors we will realize that humidity readings are misleading in such hot environments, so we have to measure grains of moisture, grains of moisture were 119 grains, this is high. A dehumidifier is needed.

Outdoor humidity was: 55 %RH at 89 F

According to the U.S. Environmental Protection Agency guide entitled Mold Remediation in Schools and Commercial Buildings, indoor humidity should be maintained below 60% relative humidity, ideally 30-50% RH, if possible.

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Building pressurization was neutral when tested with a smoke pen, this is typically considered satisfactory in residential buildings such as this, but remediation was being preformed and no negative pressure was observed in the work areas. Negative pressure of around 5 or more pascals should be maintained in the work area until passing clearance testing.

## **MOLD INSPECTION**

---

### **CONCLUSIONS**

---

Inspection / post remediation verification failed because approximately the rear 1/2 of the house was being remediated, but air scrubbers were not utilized, negative pressure and containment were not maintained, HVAC system openings and openings made in walls were not blocked with plastic sheeting, also a dehumidifier should be provided, spore suppression of any type was likely not utilized, furniture and clothes were removed from the work areas, but were placed in nearby rooms and were not covered in 6 mil plastic sheeting to protect them from cross contamination with spreading mold spores.

The only equipment observed at the site was a common household fan and this fan will not aid in drying the house out, nor will it remove spores like a air scrubber, the fan observed to be in use will only manage to stir up settled spores and move humidity from point a to point b without removing it from the air.

In addition to the above mold growth was observed in various areas of the house, primarily on the back sides of the hall bathroom walls, these walls were observed from the abutting bedroom, and the abutting kitchen, as the walls were open in these two rooms. Mold was also observed in the insulation in the attic, this inspectors experience with insulation after hurricanes is that it often traps moisture under it and hidden mold is common under insulation in attics.

## **ALLERGEN INSPECTION**

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### **OBSERVATIONS:**

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No unusual or unclean conditions likely to result in bio-allergen exposure were noted at the time of the inspection.

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### CONCLUSIONS

After a detailed visual inspection in all accessible areas that were to be inspected, no unusual conditions were observed, and no odors were detected, thus visually the inspection was satisfactory.

Property appeared to be in overall satisfactory condition in regards to allergens, thus no advice or remediation recommendations need to be provided at this time.

### **BACTERIA INSPECTION**

---

#### OBSERVATIONS:

No sewage leaks, stagnant water, foul odors, or other unclean conditions likely to be associated with excessive bacterial growth or exposure were observed at the time of inspection.

### CONCLUSIONS

After a detailed visual inspection in all accessible areas that were to be inspected, no unusual odors, excessive moisture or conditions conducive to excessive bacterial growth were observed, thus visually the inspection was satisfactory.

Property appeared to be in overall satisfactory condition in regards to bacteria, thus no advice or remediation recommendations need to be provided at this time.

### **DIGITAL PHOTOGRAPHS**

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#### PHOTO 1

The following is a digital photo of mold on insulation in attic.



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## DIGITAL PHOTOGRAPHS

### PHOTO 2

Stachybotrys mold growing on the back of drywall paper on wall that separated kitchen from hall bathroom.



## DIGITAL PHOTOGRAPHS

### PHOTO 3

Stachybotrys mold growing on plaster hidden in wall that separated kitchen from hall bathroom.



## DIGITAL PHOTOGRAPHS

### PHOTO 4

Stachybotrys mold growing on plaster hidden in wall that separated kitchen from hall bathroom.



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## DIGITAL PHOTOGRAPHS

PHOTO 5 More mold on wall between kitchen and hall bathroom.



## DIGITAL PHOTOGRAPHS

PHOTO 6 Mold and moisture stains on wall between kitchen and bathroom.



## DIGITAL PHOTOGRAPHS

PHOTO 7 Mold and moisture stains on wall between kitchen and bathroom.



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### **DIGITAL PHOTOGRAPHS**

PHOTO 8

Mold and moisture stains on wall between kitchen and bathroom.



### **DIGITAL PHOTOGRAPHS**

PHOTO 9

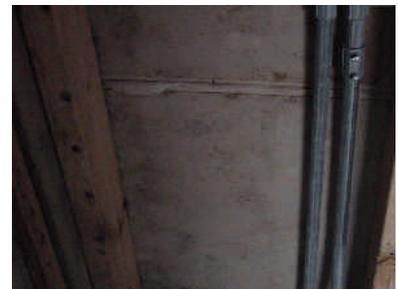
Mold and moisture stains on wall between kitchen and bathroom.



### **DIGITAL PHOTOGRAPHS**

PHOTO 10

Mold and moisture stains on wall between kitchen and bathroom.



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---

## DIGITAL PHOTOGRAPHS

### PHOTO 11

The following is a digital photo of heavy cladosporium mold growth on the insulation located on the outside of a attic AC duct.



## DIGITAL PHOTOGRAPHS

### PHOTO 12

The following is a digital photo of heavy cladosporium mold growth on the insulation located on the outside of a attic AC duct.



## DIGITAL PHOTOGRAPHS

### PHOTO 13

Mold on wooden header beam near kitchen and rear family room area.



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## DIGITAL PHOTOGRAPHS

PHOTO 14 Mold on concrete near rear family room area.



## DIGITAL PHOTOGRAPHS

PHOTO 15 Mold on concrete near rear family room area.



## DIGITAL PHOTOGRAPHS

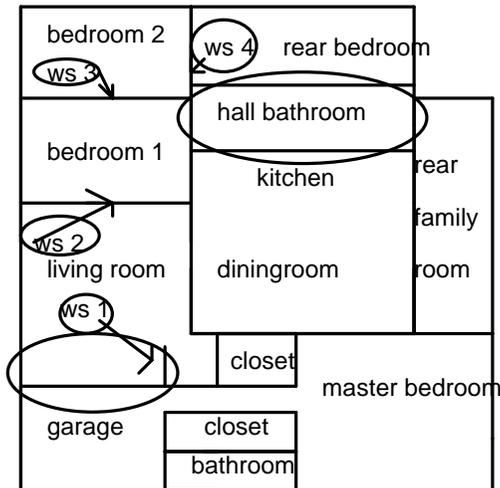
PHOTO 16 Note that during mold remediation the household items were never removed to a safe dry place for storage, nor were they left at the property and covered in protective plastic to prevent cross contamination.



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## INTERIOR SCHEMATIC



## SCHEMATIC COMMENTS

### COMMENTS

The above is a diagram of the entire house, the bathroom circled received water leakage during the hurricane, and mold grew in it's walls, but it was not remediated, all areas around this bathroom were remediated. Remediate the circled bathroom, also the West wall of the living room is circled because spore levels were high in this wall.

The letters WS on the above diagram indicates locations of inner wall samples, for example WS1 indicates the location of inner wall sample 1, and WS 2 indicates the location of inner wall sample 2.

Note that diagrams are not intended to be to scale, nor all inclusive in regards to items, rooms, and locations, actually observed at a given property.

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## AIR BORNE SPORE SAMPLES

### Air Sampling limitations and disclaimers

Though spore sampling and lab report analysis are common and are often an extremely helpful tool, there is always some degree of uncertainty regarding analysis of samples and the conclusions we draw from them. Non-viable samples only allow for spore identification to the genus and not the species level; thus, comparison of levels of similar types of indoor and outdoor spore types is not exact. Some spores that are reported to be similar are not at always from the same species of mold, they may just look similar under the microscope. This is especially true for some small, round spores, such as aspergillus and penicillium spores. Viable sampling only allows for identification and enumeration of molds that germinated from live spores. Thus, many dead yet still allergenic spores may be missed in the lab results when using this methodology, resulting in low estimations of the number of actual spores present.

### **RESULTS REGARDING AIR SAMPLE 1**

---

REPORT NUMBER: as1.

SAMPLE LOCATION: Outdoors.

SAMPLE JUSTIFICATION: This was an outdoor sample taken so that it could be compared to indoor levels in order for your inspector to determine if indoor levels were elevated in comparison to outdoor levels. This was the justification for taking the following airborne samples as well.

SAMPLING METHODOLOGY: A CyClex non viable impactor with pump, calibrated at 20 LPM ran for 10 minutes and produced a non viable spore trap sample for analysis at an accredited microbiology lab. This was the methodology used for taking the following airborne samples as well.

OUTDOOR SPORE LEVELS PER CUBIC METER OF AIR: Cladosporium spores: 80 Penicillium Aspergillus like spores: 60  
Ascospores: 20 Curvularia spores: 40.

### **RESULTS REGARDING AIR SAMPLE 2**

---

REPORT NUMBER: as2.

SAMPLE LOCATION: Kitchen.

INDOOR SPORE LEVELS PER CUBIC METER OF AIR: Penicillium Aspergillus like spores: 540 Chaetomium spores: 400  
Cladosporium spores: 160 Curvularia spores: 20.

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## CONCLUSIONS REGARDING AIR SAMPLE 2

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### INSPECTORS CONCLUSIONS

Total indoor mold spore levels were high compared to total outdoor mold spore levels thus mold may be growing and releasing spores somewhere in or near the above mentioned test area. This condition is called amplification and is the most widely accepted method for determining if mold may be growing indoors when analyzing airborne spore levels. The higher the discrepancy between indoor and outdoor levels in favor of high indoor levels, the more likely it is that mold is growing indoors.

See lab report for additional details on numbers and types of mold found at your property.  
Lab report results typically expressed sample results as spores per cubic meter of air or colony forming units per cubic meter of air for the sample area at the time of sampling.

## RESULTS REGARDING AIR SAMPLE 3

---

REPORT NUMBER: as3.

SAMPLE LOCATION: Front Guest Bedroom away from front door.

### INDOOR SPORE LEVELS PER CUBIC METER OF AIR

Chaetomium spores: 100 Penicillium Aspergillus like spores: 200  
Cladosporium spores: 60.

## CONCLUSIONS REGARDING AIR SAMPLE 3

---

### INSPECTORS CONCLUSIONS

Total indoor mold spore levels were high compared to total outdoor mold spore levels thus mold may be growing and releasing spores somewhere in or near the above mentioned test area. This condition is called amplification and is the most widely accepted method for determining if mold may be growing indoors when analyzing airborne spore levels. The higher the discrepancy between indoor and outdoor levels in favor of high indoor levels, the more likely it is that mold is growing indoors.

See lab report for additional details on numbers and types of mold found at your property.  
Lab report results typically expressed sample results as spores per cubic meter of air or colony forming units per cubic meter of air for the sample area at the time of sampling.

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### **RESULTS REGARDING AIR SAMPLE 4**

---

**REPORT NUMBER:** as4.  
**SAMPLE LOCATION:** Master Bedroom.  
**INDOOR SPORE LEVELS PER CUBIC METER OF AIR** Penicillium Aspergillus like spores: 180 Cladosporium spores: 20.

### **CONCLUSIONS REGARDING AIR SAMPLE 4**

---

**INSPECTORS CONCLUSIONS** Total spore levels in the above indoor test area were lower than total spore levels in the outdoor test area. Specific spore type in the above indoor test area were not significantly higher than similar specific types of spores found in the outdoor test area. These findings are desirable because they are very typical of indoor environments that do not have a mold problem. The above comparison method does not guarantee that there is not a mold problem at the indoor test area but it is the most relied upon method of analyzing test results. These were the conditions in the area sampled at the time of sampling. Results are expressed as spores per cubic meter of air or colony forming units per cubic meter of air.

### **RESULTS REGARDING AIR SAMPLE 5**

---

**REPORT NUMBER:** as5.  
**SAMPLE LOCATION:** Living Room not gutted.  
**INDOOR SPORE LEVELS PER CUBIC METER OF AIR** Penicillium Aspergillus like spores: 940 Chaetomium spores: 20  
Cladosporium spores: 20. Stachybotrys spores: 60.

### **CONCLUSIONS REGARDING AIR SAMPLE 5**

---

**INSPECTORS CONCLUSIONS** Many of these spores are likely spores that had settled on surfaces or on stored items placed in this room. Total indoor mold spore levels were high compared to total outdoor mold spore levels thus mold may be growing and releasing spores somewhere in or near the above mentioned test area or may have settled or drifted here from other areas. This condition is called amplification and is the most widely accepted method for determining if mold may be growing indoors when analyzing airborne spore levels. The higher the discrepancy between indoor and outdoor levels in favor of high indoor levels, the more likely it is that mold is growing indoors.

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See lab report for additional details on numbers and types of mold found at your property.

Lab report results typically expressed sample results as spores per cubic meter of air or colony forming units per cubic meter of air for the sample area at the time of sampling.

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## INNER WALL SPORE SAMPLES

### Air Sampling limitations and disclaimers

Your inspector cannot guarantee that hidden mold in a wall can be found even with the aid of inner wall spore sampling as hidden mold may not be producing large numbers of spores during sampling or the spores, if produced, may not have access to the spore trap because insulation or wall studs may block the pathway between spores and spore trap. Even if inner wall spore levels are elevated, it does not guarantee that the mold producing it in the wall will be excessive enough to be visible when or if the wall is opened.

### RESULTS REGARDING INNER WALL SAMPLE 1

---

REPORT NUMBER: ws 1.

SAMPLE LOCATION: Inside living room wall near: see included diagram for specific location.

SAMPLE JUSTIFICATION: This sample was taken in an attempt to help determine if hidden mold is likely growing in this section of this wall, or if spore levels are elevated in this section of this wall. Such sampling is often a very helpful tool because mold hidden inside walls sometimes produce elevated spore levels that often show up during inner wall sampling. Mold levels in a wall may be high enough to produce mold odors, or may be implemented in health complaints, or may result in lab results showing elevated spore levels, however mold in that same wall may not have yet grown to levels where they would be visible to the unaided eye during remediation. This was the justification used for taking the following inner wall samples as well.

SAMPLING METHODOLOGY: A CyClex non viable impactor with pump, calibrated at 20 LPM ran for 5 minutes and produced a non viable spore trap sample for analysis at an accredited microbiology lab.

INNER WALL SPORE LEVELS Chaetomium spores: 800 Penicillium Aspergillus like spores: 400  
Cladosporium spores: 320.

### CONCLUSIONS REGARDING INNER WALL SAMPLE 1

---

INSPECTORS CONCLUSIONS Inspector was able to demonstrate the release of what may be considered high mold spore levels in the above wall void. High spore levels in a wall may indicate likely growth but cannot guarantee growth in that hidden area have grown to the extent that it would be visible.

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### **RESULTS REGARDING INNER WALL SAMPLE 2**

---

**REPORT NUMBER:** ws2.

**SAMPLE LOCATION:** inside living room wall not far from garage, see attached diagram for details.

**INNER WALL SPORE  
LEVELS**

Penicillium Aspergillus like spores: 120.

### **RESULTS REGARDING INNER WALL SAMPLE 3**

---

**REPORT NUMBER:** ws3.

**SAMPLE LOCATION:** Inside living room wall near: see diagram for details.

**INNER WALL SPORE  
LEVELS**

Cladosporium spores: 120 Penicillium Aspergillus like spores: 240.

### **CONCLUSIONS REGARDING INNER WALL SAMPLE 3**

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**INSPECTORS  
CONCLUSIONS**

Lab results indicated no readings that appear to indicate the presence of unusual types or proportions of mold spores in the above test area.

### **RESULTS REGARDING INNER WALL SAMPLE 4**

---

**REPORT NUMBER:** ws4.

**SAMPLE LOCATION:** closet wall of rear bedroom, this was the bedroom at the far N.E. corner of the house.

**INNER WALL SPORE  
LEVELS**

Penicillium Aspergillus like spores: 80 Cladosporium spores: 120.

### **CONCLUSIONS REGARDING INNER WALL SAMPLE 4**

---

**INSPECTORS  
CONCLUSIONS**

Lab results indicated no readings that appear to indicate the presence of unusual types or proportions of mold spores in the above test area.

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## Surface Samples

### RESULTS REGARDING SURFACE SAMPLE 1

---

**REPORT NUMBER:** ss 1.

**SAMPLE LOCATION:** Hall Bathroom  
Specific area sampled:back side of hall bathroom wall, this was accessed from the abutting kitchen.

**SAMPLE JUSTIFICATION:** Inspector wanted to obtain information as to the types of mold that were in this area. This was the justification used for taking the following surface samples as well.

**SAMPLING METHODOLOGY:** A tape sample of actual mold from a moldy surface was taken using a clear piece of Scotch Tape or other similar clear tape. The sample was sent to a lab on a clean microscopic slide. This sample produced a mold sample for analysis at an accredited microbiology lab.  
The enclosed lab report indicates the type / genus of mold spores collected and may also indicate the approximate number of mold spores per square centimeter of area sampled. Tape samples are beneficial because they sometimes are able to pick up entire spore-producing structures intact for analysis at the lab; thus, more accurate readings are possible than with some other surface sample methods.

**SPORE LEVELS OR TYPES:** Penicillium Aspergillus like spores, Chaetomium spores.

### CONCLUSIONS REGARDING SURFACE SAMPLE 1

---

**INSPECTORS CONCLUSIONS** The above lab result appeared to indicate the presence of what may be considered high mold spore levels or high mold fiber levels also known as mycelium fragments or hyphea. Based on the inspectors visual findings and the lab results it appears that this is confirmation of likely active mold growth.

### RESULTS REGARDING SURFACE SAMPLE 2

---

**REPORT NUMBER:** ss2.

**SAMPLE LOCATION:** Hall Bathroom. Specific area sampled:back side of hall bathroom wall, this was accessed from the abutting east bedroom the wall was open.

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SPORE LEVELS OR TYPES:

Penicillium Aspergillus like spores, Chaetomium spores, Cladosporium spores.

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### CONCLUSIONS REGARDING SURFACE SAMPLE 2

INSPECTORS CONCLUSIONS

The above lab result appeared to indicate the presence of what may be considered high mold spore levels or high mold fiber levels also known as mycelium fragments or hyphea. Based on the inspectors visual findings and the lab results it appears that this is confirmation of likely active mold growth.

---

### RESULTS REGARDING SURFACE SAMPLE 3

REPORT NUMBER: ss3.

SAMPLE LOCATION: living room non suspect items surfaces.

SAMPLE JUSTIFICATION: Inspector wanted to determine if microscopic mold growth, or excessive settled spore levels had spread to this area.

SAMPLING METHODOLOGY:

A tape sample of actual mold from a moldy surface was taken using a clear piece of Scotch Tape or other similar clear tape. The sample was sent to a lab on a clean microscopic slide. This sample produced a mold sample for analysis at an accredited microbiology lab. The enclosed lab report indicates the type / genus of mold spores collected and may also indicate the approximate number of mold spores per square centimeter of area sampled. Tape samples are beneficial because they sometimes are able to pick up entire spore-producing structures intact for analysis at the lab; thus, more accurate readings are possible than with some other surface sample methods.

SPORE LEVELS OR TYPES:

Penicillium Aspergillus like spores, Chaetomium spores.

---

### CONCLUSIONS REGARDING SURFACE SAMPLE 3

INSPECTORS CONCLUSIONS

The above lab result indicated the presence of what may be considered high spore levels. Based on the inspectors visual findings, and the lab results it appears that this may be the result of excessive settled spores from possible nearby growth.

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## MOLD INFORMATION

### HELPFUL MOLD INFORMATION

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#### FUNGAL DEFINITIONS AND HEATH ISSUES:

##### **FUNGI DEFINED**

Fungi share some basic similarities with plants and bacteria but are neither. All 1 million to 1.5 million species of true fungi are in their own kingdom, the Fungi Kingdom. Many persons inaccurately use the term mildew to describe fungal growths that they feel are not harmful to human health. The powdery green or white growth in humid closets is sometimes considered by homeowners as "just mildew". Ironically this growth is almost always pen / asp mold. Many species of pen / asp produce offensive smelling volatile organic compounds, and may be toxicogenic or allergenic when present at the correct levels. According to more reliable definitions, mildew is a powdery or downey parasitic fungal growth that attacks and grows on living plants, while molds are often fuzzy and grow on all sorts of moist surfaces. Molds, mildews, and other fungi usually reproduce by forming and releasing spores into the air. Typical indoor spores are around 3 to 15 microns across. For reference the period at the end of this sentence is 500 microns.

##### **TOXIGENIC MOLDS**

Mycotoxins are chemicals that are sometimes produced by various species of molds. These toxins are real and are powerful weapons used by molds in a sort of microbial warfare to help them compete against bacteria and other molds. Mold spores in residential settings, even if they are potentially toxin producing types and are at high levels, do not necessarily result in toxic effects on humans via inhalation. It takes a lot of inhaled spores to poison a person. Currently, disagreement exists as to if residential mold spore exposures levels are ever high enough to result in toxic effect on humans. However, toxic effects of mold mycotoxins in humans and farm animals leading to serious illness and even death via accidental ingestion of toxic mold, have been well documented in scientific literature.

##### **INFECTIOUS MOLDS**

According to a Mayo clinic study, sinusitis caused by growth of fungus fibers or balls of fungus fibers in the sinus cavities is not unusual. This is typically caused by common *Aspergillus*, *Fusarium*, and *Curvularia* species. Aspergillosis caused by the growth of *aspergillus* species in the lungs most commonly *A. fumigatus*, *A. flavus*, *A. Niger* and *A. territus* species typically occurs in persons with compromised immune systems or a history of lung disease that resulted in past lung damage. Common *Candida albicans* that causes yeast infections is a major cause of serious nosocomial (hospital acquired) fungal infections. *Histoplasma capsulatum* and *Cryptococcus neoformans* are very dangerous yeast like molds that should be assumed to be present in any bird droppings but are primarily a concern when spread to humans via inhalation of particles from

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accumulations of pigeon, starling, and bat droppings. *Coccidioides immitis* mold spores are spread from dusty soil in the southwestern United States, it sometimes causes valley fever but at other times the same fungus can be deadly. Nearly any fungi can cause infections in persons with severely compromised immune systems.

Detection of infectious fungi such as but not limited to the above listed ones and identification of fungi to determine the species is not part of most mold inspections.

### **ALLERGY ASTHMA AND HYPERSENSITIVITY DISEASES**

An allergic reaction occurs when your bodies immune system mistakes harmless proteins in mold spores or other allergins as if these proteins were harmful microbes trying to infect your body. Your bodies immune system, feeling threatened releases histamines into the blood stream and these histamines are what actually causes coughing, sneeze, and watering of the eyes. Other persons immune systems will not mistake proteins in mold spores as a microbial threat, and thus not develop allergic reactions. Asthma is a condition where the smooth involuntary muscles lining the airways contract but do not properly relax to allow the lungs to bring in new air. Mold, other bio-allergins, and gases such as nitrogen dioxide and ozone, and even stress are common triggers of asthma. Many people die every year from asthma. Mold-related allergenic and asthmatic conditions in homes are very common and very serious and should be addressed and not ignored. Many serious hypersensitivity diseases in humans, such as baker's lung, wood workers lung and others are the result of exposures to molds by persons working in industries that result in long term exposure to elevated spore levels. Hypersensitivity diseases have long been well documented in science and the medical field. According to Bioaerosols assessment and control hypersensitivity pneumonitis is a hypersensitivity disease that results from the long term repeated exposure to elevated mold spore levels or other antigens, this condition can occur at in industry or agriculture where spore levels are high, it may also occur in moldy offices or homes, it produces pneumonia like symptoms with fever, cough, tightness of chest, lung infiltrates, and difficulty breathing. Once sensitized, individuals may react to extremely low, often unmeasurable, concentrations of antigenic materials.

Organic dust toxic syndrome is an flu like illness that results from a short term exposure to very high levels of spores, such as the levels that may be encountered by workers doing large mold remediation jobs without wearing protective respirators. Symptoms show up several hours or a day or so after exposure and symptoms go away after a day or a few days.

### **Recommended Reference Materials For Additional Information**

- 1) Bioaerosols Assessments and Controls, Janet Macher  
American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio (1999)
- 2) Damp Indoor Spaces and Health (2004)  
Board of Health Promotion and Disease Prevention, Institute of Medicine.

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## SPORE LEVEL INFORMATION

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#### GENERAL INFORMATION ON MOLD SPORE LEVELS

##### **Disclaimers on the following mold spore level information:**

The below information was not provided as set health hazard specifications because reactions to mold spores will always differ from person to person. Many substances and factors including but not limited to the following may complicate matters even more: levels of dust mite and roach allergins, volatile organic compounds, gram negative bacteria, individual sensitivity to allergins, emotional stress, and general health. This information should not be relied on as any type of medical advise, see your doctor if you feel sick.

##### **Guidelines on Assessment and Remediation of Fungi in Indoor Environments**

**published in 2000 by the New York City Department of Health.**

The most widely accepted guideline across the nation to help determine if indoor mold spore levels are indicative of a possible mold problem is the comparison of indoor and outdoor mold spore levels. Indoor mold spore levels should be similar to or lower than levels found outdoors, and the types of mold spores found indoors should be similar to types found outdoors. Most mold inspectors, certified indoor environmentalist, and industrial hygienists also will generally support the above mentioned comparison method. The below listed organizations and governing bodies also support the above view.

ACGIH 1989, Canada M&H CO. 1991, ACGIH 1993, OSHA 1994, and Brazil 2000.

**When reading the below quotes remember that the mathematical symbol > means greater than and < means less than.**

##### **Burge 1990**

If indoor microbial aerosols qualitatively differ from outdoor, and indoor levels are consistently more than double the outdoor levels and exceed 1000 cfu per cubic meter of air, investigate.

##### **American Conference of Governmental Industrial Hygienists (Air Sampling Instruments for Evaluation of Atmospheric Contaminants 1995)**

100 cfu or less per cubic meter of air is low.

100 cfu to 1000 cfu per cubic meter of air is intermediate.

1000 or more cfu per cubic meter of air is high.

**Much of the below information on studies from around the world is from**

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**Worldwide Mold Exposure Standards for Mold and Bacteria, Robert C. Brandys, PhD, MPH, PE, CIH, CSP, CMR and Gail M. Brandys, MS, CSP, CMR:**

**Brazil Government Findings 2002**

100-500 normal indoor mold spore levels per cubic meter of air, can be higher in summer.

**Norway Government Findings**

<750 acceptable.

**OSHA 1992 findings**

>1,000 Contamination

**ACGIH 1993 Findings**

>1,000 High

**Czech Republic 2000 Findings**

> 2,000 Health complaints.

**American Academy of Allergy, Asthma and Immunology/National Allergy Bureau findings 2002**

1 - 6,499 Low- Only individuals extremely sensitive to these pollens and molds will experience symptoms.

6,500 - 12,999 Moderate - Many individuals sensitive to these pollens and molds will experience symptoms.

13,000-49,999 High Most individuals with any sensitivity to these pollens and molds will experience symptoms.

50,000 Very High - Almost all individuals with any sensitivity at all to these pollens and molds will experience symptoms. Extremely sensitive people could have severe symptoms.

**Recommended References Materials For Additional Information**

1) Worldwide Mold Exposure Standards for Mold and Bacteria, Robert C. Brandys, PhD, MPH, PE, CIH, CSP, CMR and Gail M. Brandys, MS, CSP, CMR

2) American Academy of Allergy, Asthma and Immunology National Allergy Bureau findings 2002