ENVIRO KING
Indoor Environmental Investigations

Pre Mitigation Impact Assessment

(According to IICRC S500 Section 10.6.7)

Inspection Performed At:

John Sample

123 Any Street
Any Town, FL 33333

Inspection Performed On:

January 1, 2024

Inspection Performed By:

Indoor Environmental Professional
John Doe

Report Contains:

Cause and Origin of Loss
Subrogation- ITEL Samples
Bacterial Sampling - Enviro Reveal
Moisture Mapping - Drying Environment
Indoor Environmental Professional
Assessment - Equipment Description
Building Materials Impact - HVAC Cleaning
Sampling Methodologies - Summary of Findings
Protocol and Equipment Directives

Prepared by Enviro King

PO Box 771006, Winter Garden, FL 34777

John Doe,

On November 12, 2023, According to the IICRC S500 Section 10.6.7, Enviro King performed an Indoor Environmental Professional Pre-Mitigation Impact Assessment.

Due to a reported water loss event, bulk water and/or surface swab samples were collected during the investigation. These samples were collected and analyzed onsite and recorded in this report. At-Risk Biological Markers were detected and industry-graded as follows:

The water loss event is industry-graded as a

CATEGORY 3

I. Cause and Origin of Loss:

Property Description: Townhouse, 2 story, 1,300 SF, Built in 1967

Source: Valve Leak In Vanity

Room: Bathroom

Loss Narrative: The homeowner went downstairs to find standing water all over the floor.

Rooms Affected: Living Room, Bathroom, Kitchen, Dining Room

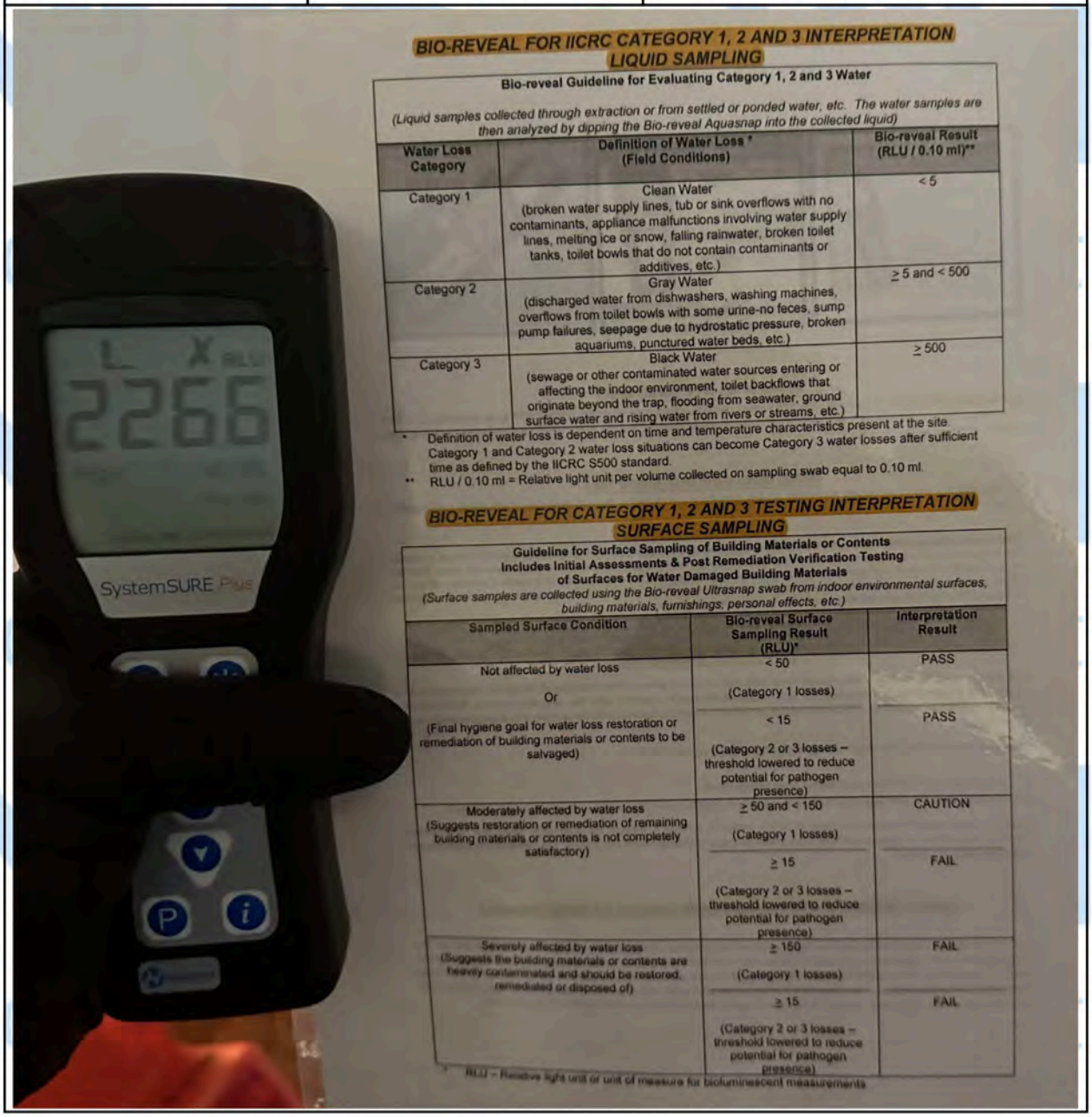
Subrogation: No product failure or persons appear to be at fault for this loss.

ITEL Samples: Collect and save all flooring material samples. Place in a zip lock bag, leave onsite for the field adjuster.

Cause of Loss Picture

II. Bacterial Sampling: Higher Than Recommended

Description	Location	Type
Enviro Reveal	Living Room	Pre-Mitigation #2266



BIO-REVEAL FOR IICRC CATEGORY 1, 2 AND 3 INTERPRETATION
LIQUID SAMPLING

Bio-reveal Guideline for Evaluating Category 1, 2 and 3 Water

(Liquid samples collected through extraction or from settled or ponded water, etc. The water samples are then analyzed by dipping the Bio-reveal Aquasnap into the collected liquid)

Water Loss Category	Definition of Water Loss * (Field Conditions)	Bio-reveal Result (RLU / 0.10 ml)**
Category 1	Clean Water (broken water supply lines, tub or sink overflows with no contaminants, appliance malfunctions involving water supply lines, melting ice or snow, falling rainwater, broken toilet tanks, toilet bowls that do not contain contaminants or additives, etc.)	< 5
Category 2	Gray Water (discharged water from dishwashers, washing machines, overflows from toilet bowls with some urine-no feces, sump pump failures, seepage due to hydrostatic pressure, broken aquariums, punctured water beds, etc.)	≥ 5 and < 500
Category 3	Black Water (sewage or other contaminated water sources entering or affecting the indoor environment, toilet backflows that originate beyond the trap, flooding from seawater, ground surface water and rising water from rivers or streams, etc.)	≥ 500

* Definition of water loss is dependent on time and temperature characteristics present at the site. Category 1 and Category 2 water loss situations can become Category 3 water losses after sufficient time as defined by the IICRC S500 standard.

** RLU / 0.10 ml = Relative light unit per volume collected on sampling swab equal to 0.10 ml.

BIO-REVEAL FOR CATEGORY 1, 2 AND 3 TESTING INTERPRETATION
SURFACE SAMPLING

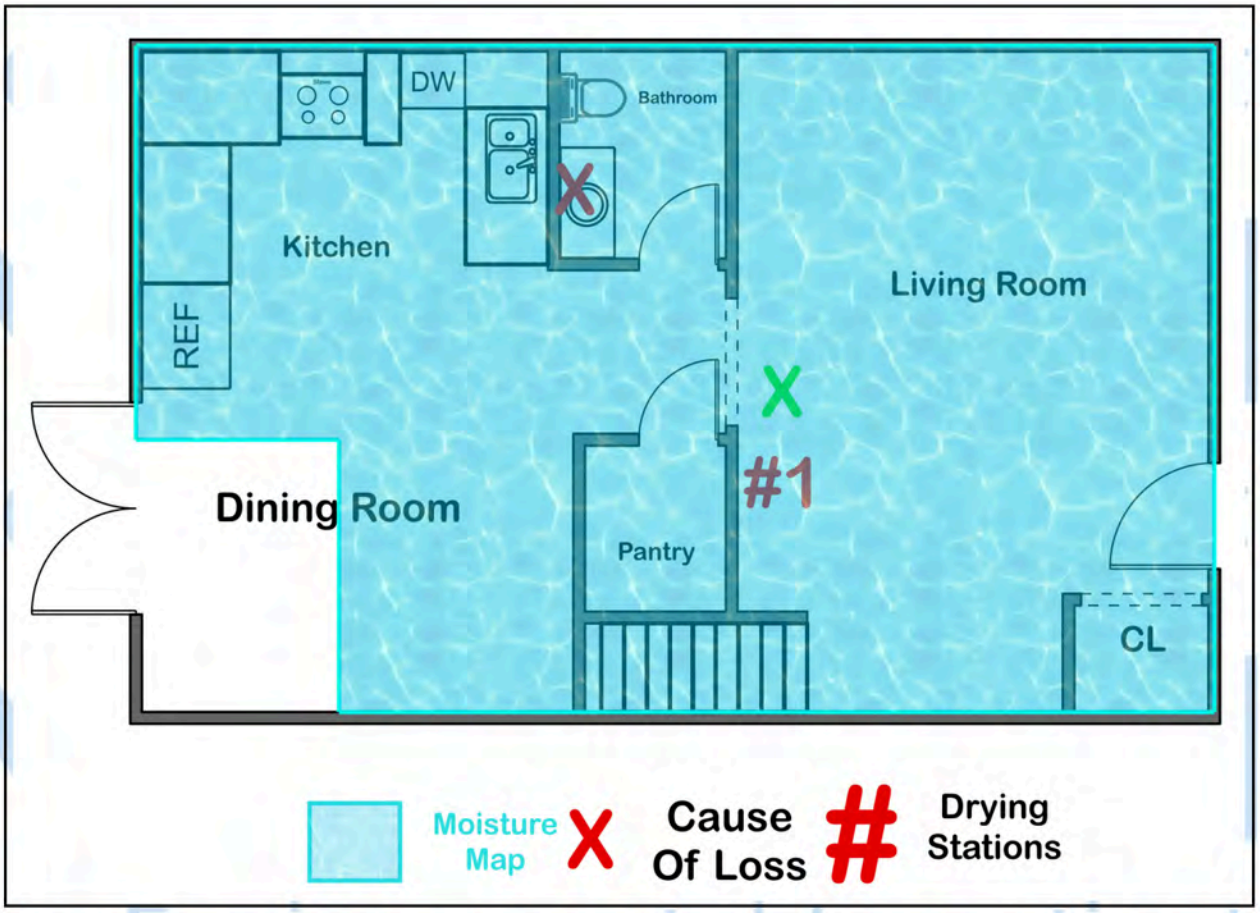
Guideline for Surface Sampling of Building Materials or Contents
Includes Initial Assessments & Post Remediation Verification Testing
of Surfaces for Water Damaged Building Materials

(Surface samples are collected using the Bio-reveal Ultrasnap swab from indoor environmental surfaces, building materials, furnishings, personal effects, etc.)

Sampled Surface Condition	Bio-reveal Surface Sampling Result (RLU)*	Interpretation Result
Not affected by water loss Or (Final hygiene goal for water loss restoration or remediation of building materials or contents to be salvaged)	< 50 (Category 1 losses)	PASS
	< 15 (Category 2 or 3 losses – threshold lowered to reduce potential for pathogen presence)	PASS
Moderately affected by water loss (Suggests restoration or remediation of remaining building materials or contents is not completely satisfactory)	≥ 50 and < 150 (Category 1 losses)	CAUTION
	≥ 15 (Category 2 or 3 losses – threshold lowered to reduce potential for pathogen presence)	FAIL
Severely affected by water loss (Suggests the building materials or contents are heavily contaminated and should be restored, remediated or disposed of)	≥ 150 (Category 1 losses)	FAIL
	≥ 15 (Category 2 or 3 losses – threshold lowered to reduce potential for pathogen presence)	FAIL

* RLU – Relative light unit or unit of measure for bioluminescent measurements

III. Moisture Mapping & Drying Stations



The practice of Moisture Mapping is critical in establishing clear directives and creating a decisive moisture recovery plan for drying the bones of the building. Establishing a dry standard of like and kind building materials provides for a targeted drying outcome.

According to the IICRC S500 Section 10.6.8, Initial Moisture Inspection was performed on the date of the investigation. Moisture Mapping was used to display the detailed information gathered during said investigation. Utilizing the Delmhorst Hammer Probe to establish and document areas of the structure, framing, and wood subfloors that may be at-risk for elevated Moisture Content (MC). Establishing Drying Stations help to navigate daily moisture mapping of the building, allowing for consistent and documented dry logs during the moisture recovery process.

An established drying standard for wood materials within this structure is <12% (MC).

An established drying standard for all drywall within this structure is <.05% (MC).

Drying Station	Flooring MC	Sill Plate/Stud MC	Concrete MC
Bathroom	100%	40%	40%(Vanity)
Dining Room	80%	40%	15.5%(Drywall)
Kitchen	100%	None Detected	36.3%(Cabinetry)
Living Room	100%	40%	23.5%(Drywall)

IV. Summary Of Findings

The investigation revealed suspect conditions as follows:

- Elevated Moisture Content
- At Risk Biological Markers
- Category of Loss

This report pertains solely to the work that needs to be done in order to properly and safely return the home to its pre-loss state. This report does not deem the property to be clear of any asbestos/lead hazards that may be present and can only be determined by proper testing.

V. Drying Chamber/Drying Environment

Drying Chambers/Drying Environments establish a controlled environment, which may be defined by existing or temporary barriers, in which evaporation from damp or wet materials is encouraged, leading to an accelerated reduction in their moisture level or moisture content. A project may have multiple, separate drying environments, which may have varying determinations for Category and assignment of Class.

Drying Chambers/Drying Environments are established to isolate a specific area for treatment where you can more efficiently manipulate the humidity, airflow, and temperature. The barrier around the affected area not only protects the rest of the property from mold and moisture. By treating the space in this manner, you dramatically reduce the volume of the drying area for faster drying. This can save you from pulling out flooring or additional materials to manage the restoration job.

In order for airflow to be effective, it requires contact with the wet surface to displace the moisture that can then be treated with a dehumidifier. Containing the area in a Drying Chamber/Drying Environment ensures you can control the internal environment to meet your desired outcome.

VI. Indoor Environmental Professional (IEP)

An IEP is defined by the IICRC as, “An individual with the education, training, and experience to perform an assessment of the microbial ecology of structure, systems, and contents at a job site, create a sampling strategy, and sample the indoor environment” and to “determine Category of water or Condition 1, 2, and 3 for the purpose of establishing a scope of work and verifying the return to a normal microbial ecology (e.g. Condition 1).”

An IEP should be used to assess the levels of contamination for the preliminary determination. Thus, the determination of the category of water should be performed by a person that meets the appropriate standard, especially when certain conditions or “risk situations” are present.

Section 10.6.7 recommends the use of an Indoor Environmental Professional (IEP) if “there is a need to determine that the water actually contains contamination.”

VII. Sampling Methodologies

ATP Test - The ATP test generates a number that correlates to the number of pathogens living on a surface. If an ATP reading is high, it is an indication that additional cleaning needs to be performed before microbes on a surface grow out of control, potentially causing serious illness.

Bacterial Swab Samples - Sampling for total bacterial count is designed to count and identify the presence of total bacterial concentrations on building materials. The swab samples are collected via the “Hygenia” water sample swabs. A small amount of water is swabbed from the suspected building material and run through an onsite ATP meter for the “bacteria number” the unit produces. Based on the bacterial concentration, the “Category of Loss” can be determined. ATP stands for adenosine triphosphate, which is an energy molecule found in all living things. By testing for the presence of ATP on a surface, Inspectors are testing for the presence or growth of microorganisms, like bacteria.

VIII. Category of Loss Assessment

Category 1: No At-Risk Biological Markers
A Category 1 water loss is when the water originates from a sanitary water source and does not pose a substantial risk if ingested or inhaled.

Category 2: At-Risk Biological Markers
A Category 2 water loss is when water contains contamination and has the potential to cause sickness if contacted or consumed by humans. Category 2 water can contain potentially unsafe levels of microorganisms or nutrients for microorganisms, as well as organic and inorganic matter.

Category3: At-Risk Biological Markers
A Category 3 water loss is when the water can contain pathogenic, toxigenic, or other harmful agents, such as silt, pesticides, organic matter, heavy metals, regulated materials, or toxic organic substances.

IX. **Mitigation Assessment** includes the following:

- Visual inspection and assessment focused on locating signs of mold growth and elevated moisture content within the structure areas as well as odor concerns in the living space.
- Use of a **Delmhorst Moisture Meter with Hammer Probe** and thermal imager to help locate areas of actively wet building materials and to test moisture content of suspect areas.
- Analytical analysis by collection of microbial samples.
- Provision of a written report of the limited assessment findings.

X. Relative Humidity Readings

Relative humidity (RH) readings were obtained from both the interior and exterior of the property. The RH was measured and recorded to determine the potential effect it may have on microbial amplification.

Guidance on RH in occupied buildings is provided by the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) in the ANSI/ASHRAE Standard 62-2001, *Ventilation for Acceptable Indoor Air Quality*. The RH in habitable spaces preferably should be maintained between 30% and 60% to minimize the growth of allergenic and pathogenic organisms (e.g., dust mites, fungi and associated mycotoxins).

XI. Moisture Content Readings

A moisture meter was utilized on this project to measure the moisture content (MC) of certain building materials (framing, walls, ceilings, flooring, slab, crawlspaces, etc.) throughout the structure, especially areas suspected of water intrusion. Measurement and recording of MC is performed to detect building materials containing unacceptable levels of moisture.

Fungal growth requires moisture, a food source, and fungal spores. Thus, wood and building materials that are continuously dry should not promote microbial growth. Construction materials with elevated MC are likely to promote fungal growth. It is required that the source of moisture be located and corrected immediately.

NOTE: When a moisture meter is used in a non-penetrating manner, it is NOT possible to obtain a reading of "Wet" even if there is no excessive moisture. This can occur when there are certain types of materials below the surface being measured, such as metal. Moisture readings should be taken with an intrusive meter that can detect the actual content of moisture in each building material. If a non-invasive meter is used, it can only be used to determine a relative percentage based on a non-affected item in the home of the same like, kind and quality.

In recording the moisture content of sill plates, studs and wood materials, a hammer probe is required for moisture content detection and identification to accurately record the true moisture content of each building material. This is the only true method to determine moisture content in these items.

XII. Equipment Descriptions and Proper Uses:

Air Movers are the best way to dry carpet, walls, and other flooring affected by water damage. An air mover is not a fan. Fans fail to concentrate air movement at the ground level. These machines solve that problem. They blow air directly over the floor which causes water molecules to evaporate quickly.

Air movers are required to be set in a circular rotation known as a “cyclone” and when set correctly, can create the industry standard “cyclone effect” that causes a drying “eye” in the center of a drying chamber.

LGR Dehumidifiers (Low Grain Refrigerant): Dehumidifiers use advanced technology to achieve rapid drying. Once a conventional dehumidifier has already reduced humidity to around 30%, an LGR dehumidifier is used to finish the job. These dehumidifiers pre-cool the intake air, which leads to drier, more breathable air. They are also more energy efficient than regular dehumidifiers and restore affected areas faster.

When set in the center of the “eye” of a drying cyclone, the dehumidifier will get the maximum performance of airflow and be able to more quickly strip the moisture from the breathing envelope of the drying chamber.

Moisture seeks dry, by drying the ambient environment the structure will release moisture into the air.

Wall Cavity Drying Systems consist of an air mover and an adapter to force air into the wall cavity that can not be reached by other conventional means.

After a water loss, moisture can be trapped in wall cavities out of sight from the restorer. This trapped moisture can soak into the bones of the building and be difficult to remove. Wall cavity drying units create positive pressure in the wall cavity as well as circulation that pushes trapped moisture out of the wall cavity and into the breathing envelope of the building for the dehumidifiers to strip and remove from the air space.

Wall cavity drying systems consist of an air mover and an adapter to force air into the wall cavity that can not be reached by other conventional means.

Air Scrubbers also known as Air Purifiers are used to purify the air after a water loss. These HEPA units can remove particulates up to 0.3 microns from the air inside and outside of the drying chambers that are created from debris removal, air movement and bacterial disturbance.

If left untreated for even 48 hours, water damage can lead to the growth of mold. Mold makes the air dangerous to breathe for anyone. It can be particularly dangerous for people with breathing conditions like asthma. Air scrubbers pull pollutants through a filter to clean the air using negative air pressure. Using an air scrubber guarantees the air is safe and breathable after water damage has occurred.

These units should be placed alongside the Dehumidifier in the “eye” of the drying cyclone for maximum efficiency.

Air Scrubber Additional Information:

A casual check of material safety data sheets and installation labeling instructions reveals a surprising amount of product information, which will create an awareness of risks that may have been overlooked in the past. Constantly changing regulations will require restorers to pay more attention and insurance professionals to develop a better understanding of changing protocols.

XIII. Building Materials Impact:

Here is a list of building materials frequently encountered and disturbed by restorative drying companies that would require the use of Air Scrubbers on a jobsite:

Suspended ceiling tiles: Overexposure to airborne dust may cause respiratory, skin, and eye irritation. Overexposure to respirable crystalline silica or man-made vitreous fiber may cause serious chronic or delayed lung disease or cancer (from the warning label).

Fiberglass insulation: There is a possible cancer hazard by inhalation. Avoid breathing fiberglass dust. Operations, such as sawing, blowing, tear out, and spraying may generate airborne concentrations requiring additional respiratory protection (from the warning label).

Cement board: Contains respirable crystalline silica. This may cause cancer (from the warning label).

VCT floor tile: Existing in-place resilient floor coverings and asphaltic adhesives may contain asbestos fibers and/or crystalline silica. These products should not be sanded, dry swept, dry scraped, drilled, sawed, or chipped (from the warning label of the new product).

Wood dust: This has been classified as a nasal carcinogen in humans. This can cause allergic respiratory effects, eyes, and skin irritation (from the wood dust webpage).

Stain proof grout: This product contains crystalline silica. This may cause cancer if inhaled (from the warning label).

Drywall: This product contains crystalline silica. This can cause lung disease or lung cancer. Exposure to dust generated during the handling or use of the product may cause temporary irritation to eyes, skin, nose, throat, and upper respiratory tract (from the MSDS sheet).

Stone tile dust: This may contain crystalline silica. This is a known cancer producer.

Household dust: Household dust harbors a cocktail of toxic chemicals that have been linked to an increased risk of a range of health hazards, from cancer to problems with fertility, researchers in the U.S. have found (from The Guardian).

Laminate flooring: This is a wood-based product and wood dust may be generated while cutting, sawing, sanding, machining, or otherwise altering this product. Wood dust has been classified by the State of California as a substance known to cause cancer (from the warning label).

Conclusion: As a reasonable observer, one can see from this short list of materials frequently disturbed, unknown and potentially dangerous dusts and bacteria may be created or disturbed during a restoration project.

Therefore, it is our directive to require an air scrubber be placed on all water restoration projects, no matter the category or class, according to industry calculations and adequate air exchanges.

XIV. HVAC Mechanical and Air Duct Cleaning:

Air ducts need to be cleaned after every water mitigation/mold remediation project. Because air ducts are pulling air from spaces and delivering the conditioned air back to those spaces, they are also pulling in any particulate or debris and pumping it back into the same space. It is not uncommon for an air duct to accumulate several pounds of dirt and debris. When these particulates enter the air ducts they may fully cycle through the system or stay lodged in the air ducts, only to come loose months or years down the roads.

It is a common misconception that the category of loss dictates the necessity of duct cleaning as this is not the case. Any work in the home that disturbs the breathing envelope (including air movement) will send bioaerosol particulates into the air conditioning system and disperse it throughout the ducts. Even common dust that is in the home will be disturbed by water mitigation and be dispersed.

Disturbed particulates are not a “pre-loss” condition and therefore, must be addressed as an area of concern during the mitigation process.

Cleaning of the HVAC Mechanical and Air Duct System is critical in order to bring the property to its pre-loss condition.

Enviro King’s Indoor Environmental Professional(IEP) utilizes the Matterport 3D scanning system to render a “digital twin” of the affected area relative to this claim.

The Matterport scan can be made available to the carrier, adjuster and homeowner at their request with certain limitations and requirements.

Please contact the Enviro King support desk at Reports@EnviroKing.com to receive additional information regarding this very helpful option.

Matterport

XV. Limits, Descriptions and Responsibilities

If anything in this report is unclear, it is your responsibility to ask for clarification on the findings. It is very important that you carefully read all of the report in its entirety.

Enviro King performed a “limited” assessment at the listed property in accordance with the IICRC and commonly accepted practices. A limited assessment addresses only those building materials and issues that are present, visible and reachable during the inspection. This report and associated conclusions are based on the visible conditions of the assessed areas, materials and information reported by the client. The assessor does not climb over obstacles, move furnishings or stored items, or go into any area that might present a safety hazard.

Enviro King makes no guarantees or warranties, expressed or implied, regarding the condition of the property. Enviro King reserves the right to revise opinions and conclusions if necessary and warranted by the discovery of new or additional circumstances. This report is specific and “limited” in nature and shall not be relied on as an end-all, be-all report. It is always possible that hidden mold growth exists beyond the visibly accessible areas, or additional areas may be wet that were not assessed.

This assessment was only to identify concerns that are accessible during the inspection and the inspector is not required to identify any potential issues outside of the assessment. If any issues were mentioned, expressed, or implied, outside of the assessment, Enviro King takes no liability or professional standings in these items and does not imply that the inspector is qualified to make such comments on these issues.

Items identified in this report do not obligate any party to make repairs or take other actions,however, failure to address items noted in this report, may lead to mold growth and/or further damage to the structure. This service does not include follow-up inspections or testing to verify that proper corrections have been made.

This report is provided, intended for and specifically written for the client named above.

XVI. Conclusion of Findings

Based on the findings of the visual inspection and/or the results of the sample(s) collected, additional action steps are required.

Required Action Steps: CATEGORY 3 Decontamination and Recovery

Building Material Removal:

1. Remove baseboards.
2. Remove drywall, 2-foot flood cut from the bottom.
3. Remove all nails and screws.
4. Remove flooring to expose slab or wood subfloor.
5. Remove base cabinets and vanities.
6. Remove doors and door casings.

Now all wood studs, sill plates and floors are exposed and ready for cleaning:

1. HEPA vacuum the remaining drywall top to bottom and exposed wood studs and floor.
2. Use metal wire brush or sand the studs if needed.
3. Chemical wipe down the remaining drywall from top to bottom.
4. Cover the remaining drywall with 6 mil plastic tape in place like a containment wall. This will protect the drywall when introducing pressure steam cleaning to the exposed structure.

Pressure wash with at least 1000 PSI with steam when possible:

1. Apply antimicrobial with a pump sprayer to all exposed surfaces, wood studs, and floor.
2. Soak and allow at least 10 minutes of dwell time for the chemical to set in.
3. Now with careful intent, pressure wash all exposed surfaces and extract at the same time.
4. Make sure to work the sill plate at the floor, push out all the particulate matter and anything else that you can remove from under the plate.
5. Once all the washing and extracting is completed visually inspect your work area.
6. Document your post-cleaning moisture readings. Place your drying equipment as directed.

Outside the Affected Area (Adjacent Areas)

Use HEPA filtration equipment to scrub the air inside the structure during remediation. Post Assessment testing will include at least one indoor control air sample.

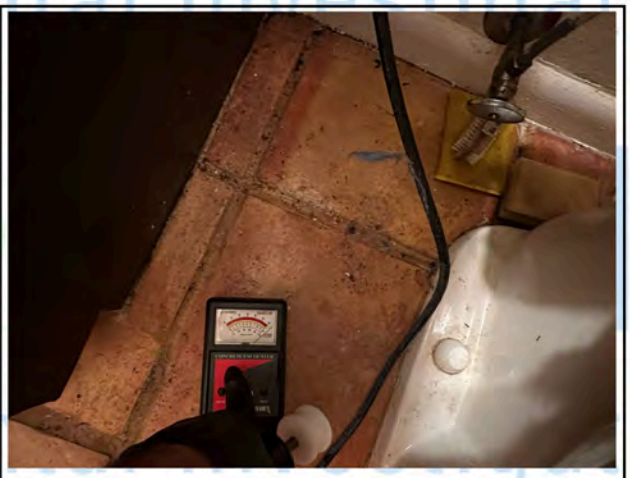
1. Recommend having all ductwork and air handling units be cleaned by a licensed HVAC contractor due to material removal in the home.

Final Clearance

1. Request final clearance investigation with Enviro King to certify that this Water Mitigation Protocol has been successfully executed and the property has been restored to its pre-loss condition.

Jobsite Photos: Drying Stations Photos

Drying Station Bathroom - Sill Plate



Drying Station Bathroom - Flooring

Drying Station Bathroom - Vanity

Drying Station Dining Room - Flooring

Drying Station Dining Room - Sill Plate

Drying Station Dining Room - Drywall

Drying Station Kitchen - Cabinetry

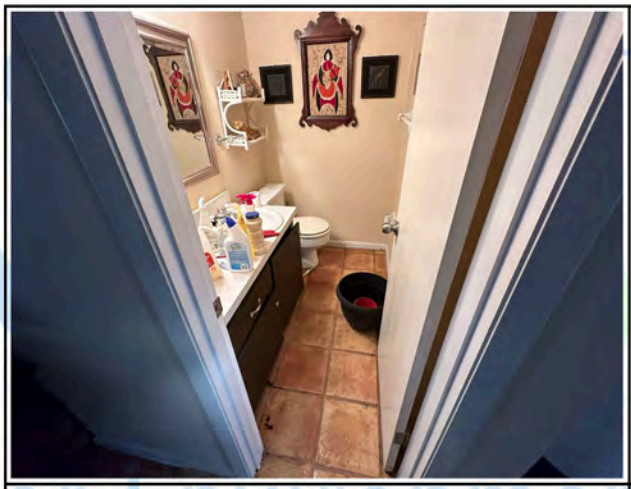
Drying Station Kitchen - Flooring

Drying Station Living Room - Sill Plate

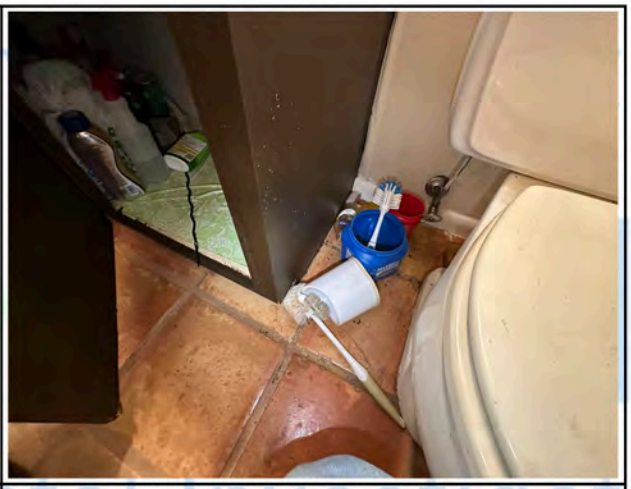
Drying Station Living Room - Flooring

Drying Station Living Room - Drywall

Jobsite Photos: Job Site and Additional Reading Photos



Bathroom



Bathroom Visible Water Damage

Bathroom Thermal Imaging

Bathroom Thermal Imaging

Bathroom Thermal Imaging

Bathroom Thermal Imaging

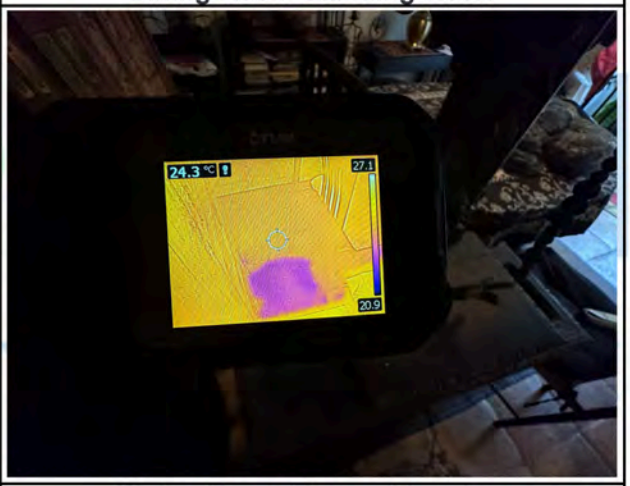
Dining Room

Dining Room

Dining Room Standing Water

Dining Room Standing Water

Dining Room Thermal Imaging



Dining Room Thermal Imaging

Dining Room Thermal Imaging

Dining Room Thermal Imaging

Kitchen

Kitchen Thermal Imaging

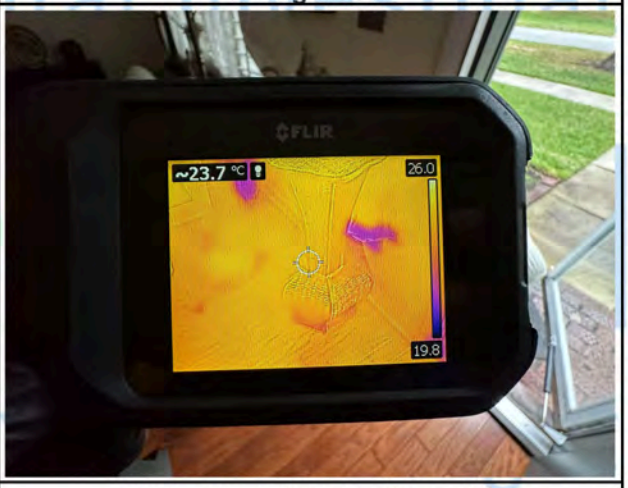
Kitchen Thermal Imaging

Kitchen Thermal Imaging

Living Room

Living Room

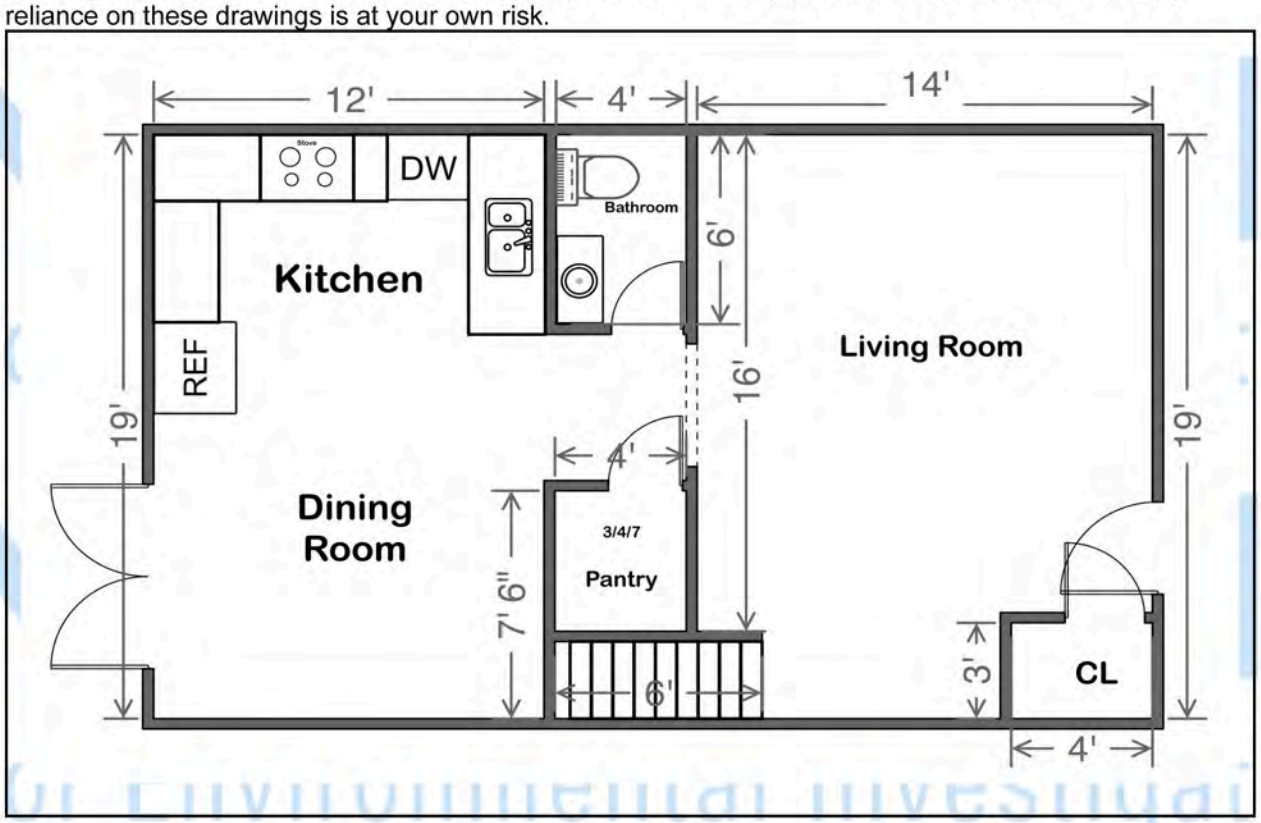
Living Room Thermal Imaging

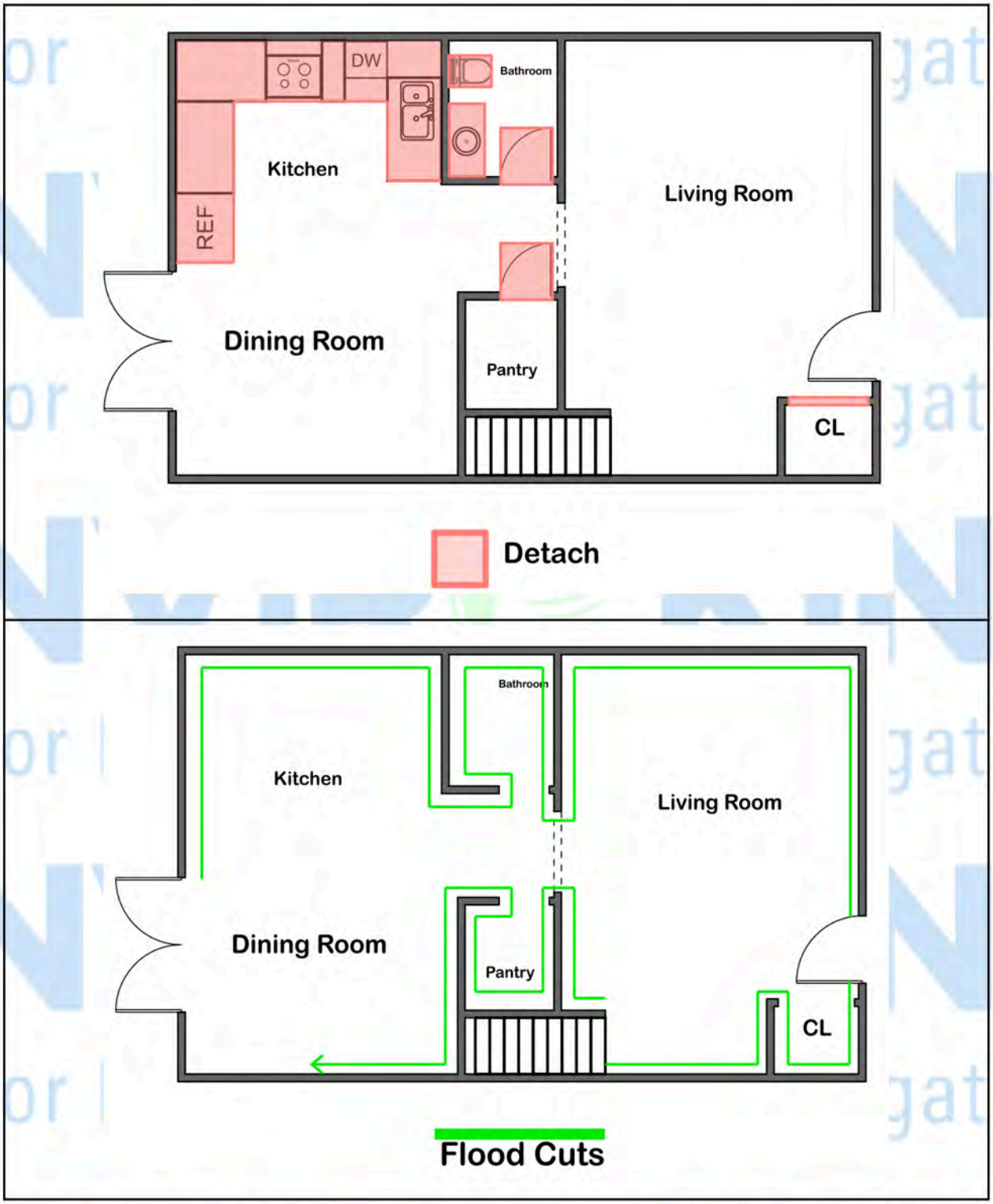


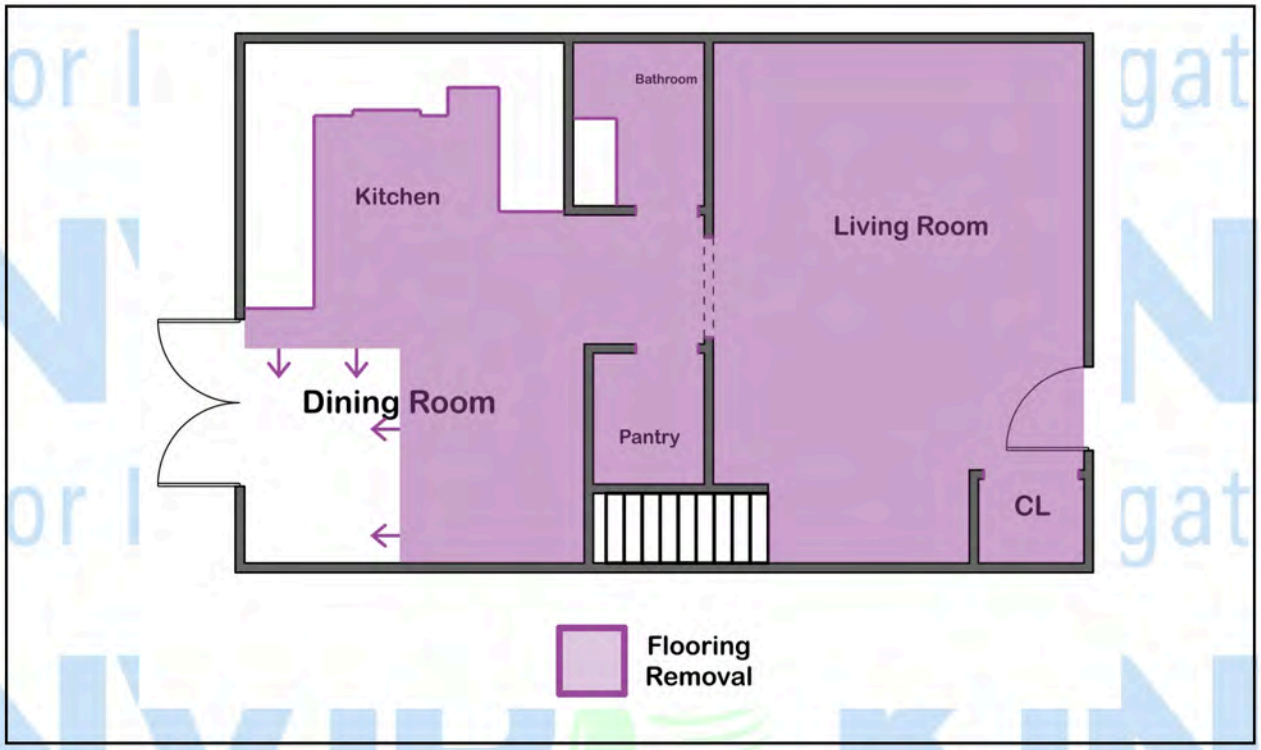
Living Room Thermal Imaging

Work Plan Drawings:

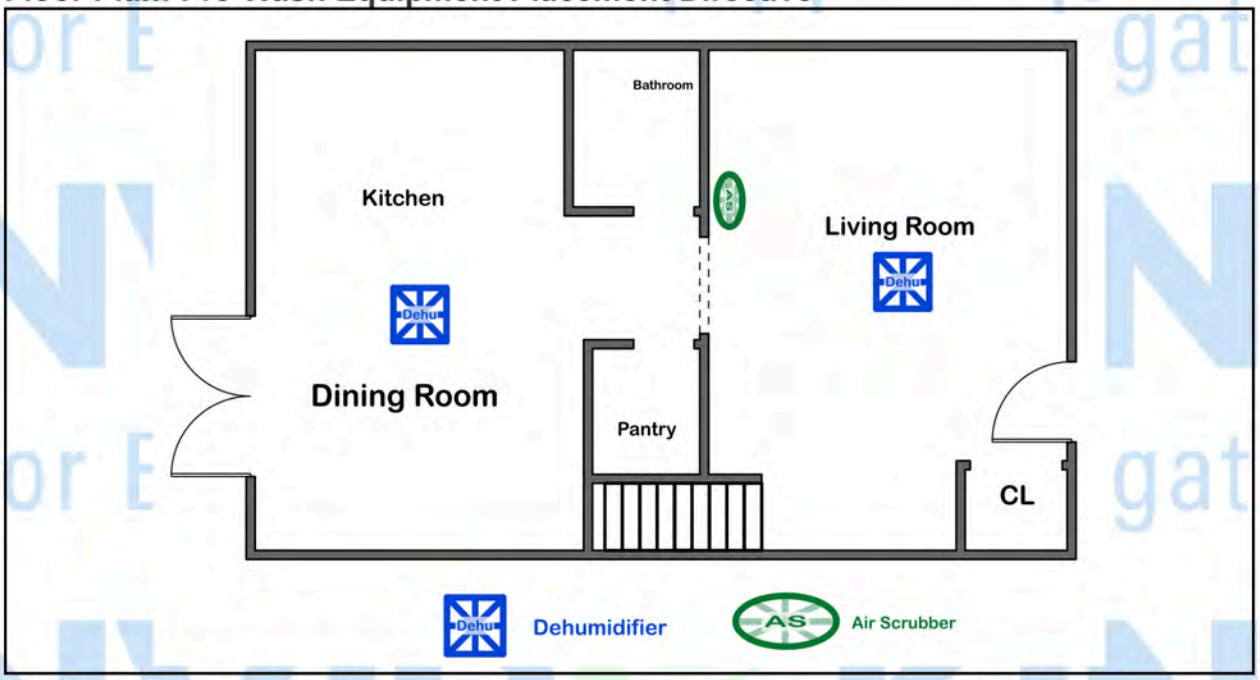
Disclaimer : The drawings provided herein are estimates and are intended solely for illustrative purposes. Accuracy is not assumed, and the actual dimensions, proportions, or other specifications may vary. These drawings are not to be considered as precise representations or guarantees of the final product. Any reliance on these drawings is at your own risk.






Bathroom
Kitchen
Living Room
Dining Room
Pantry
CL
Flooring
Removal

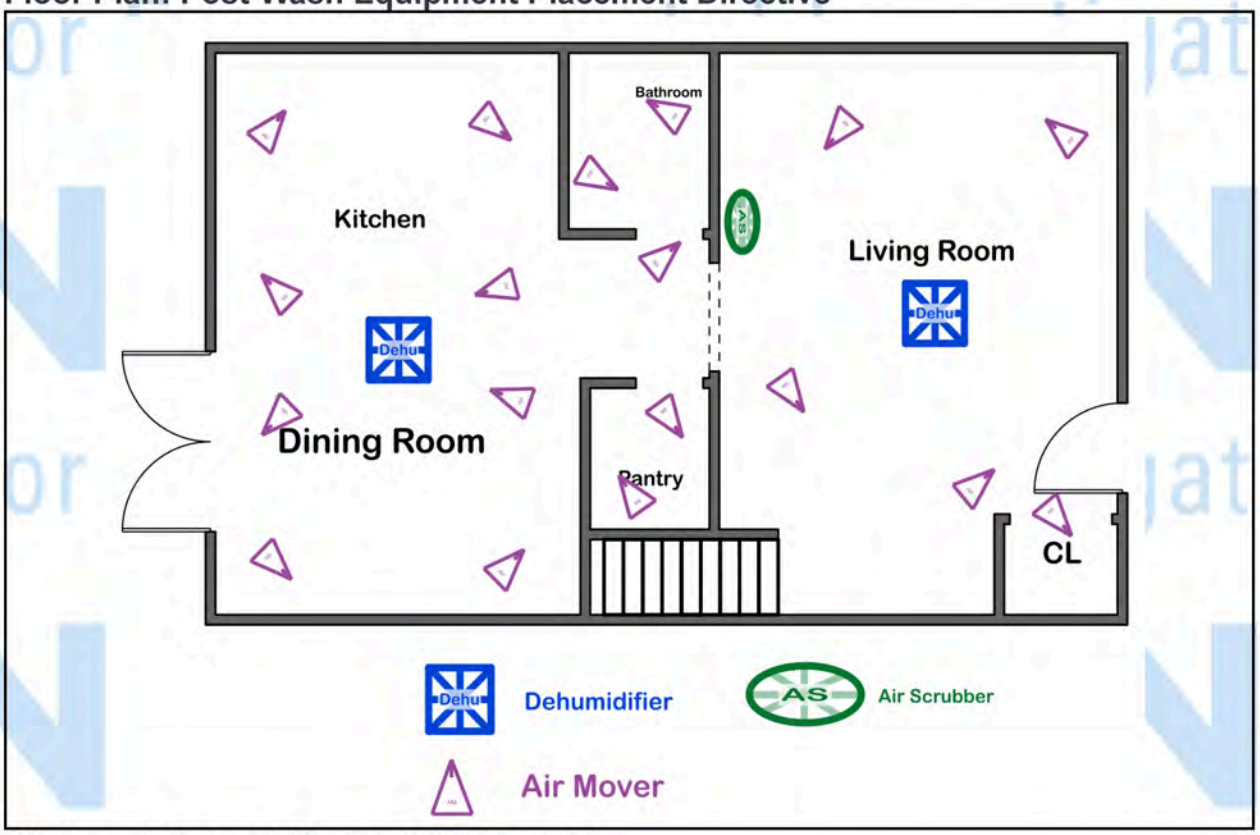
Floor Plan: Pre-Wash Equipment Placement Directive



Kitchen: 1 Dehumidifier(s)

Living Room: 1 Dehumidifier(s), 1 Air Scrubber(s)

Floor Plan: Post-Wash Equipment Placement Directive



Kitchen: 1 Dehumidifier(s), 4 Air Mover(s)
Dining Room: 4 Air Mover(s)
Living Room: 1 Dehumidifier(s), 1 Air Scrubber(s), 5 Air Mover(s)
Bathroom: 3 Air Mover(s)
Pantry: 2 Air Mover(s)