20/20 PROPERTY INSPECTIONS

52 Any Street
City, CA 926XX

Prepared for: Michele and Jim Clients

Prepared by: 20/20 Advanced Property Inspections
26741 Portola Parkway, #1E-469
Foothill Ranch, CA 92610

Table of Contents

General Information

File Number: **190815 - 52 Any street**

Property Information

Property Address: **52 Any street**
City: **City** State: **CA** Zip: **926XX**

Building Type: **Single Family Residence, Two Levels. Reported sq. ft. [2325].**

Estimated Age: **Reportedly built in [1997]: 22**

Entrance Faces: **Primarily Northwest** Occupancy: **Owner Occupied**

Inspection Date: **08/15/2019**

Start Time: **2:00pm** End Time: **4 pm**

Client Information

Client Name: **Michele and Jim Client**
Contact Name: **Agent: Joe**
Others Present: **Michele and Jim Clients, agent: John G., listing agent: Rick C., 2 home inspectors, 2 or more plumbers, flooring sales rep.**

Inspection Company

Inspector Name Michael Cantor
Company Name 20/20 Advanced Property Inspections
Address 26741 Portola Parkway, #1E-469
City Foothill Ranch State CA Zip 92610
Phone: **949-275-4950** Fax:
E-Mail: **2020APMI@Gmail.com**
Web Site: **www2020HI.com**
Inspector Name: **Michael Cantor**

Weather Conditions

Weather: **Clear**
Temperature (F): **85**
Soil Conditions: **Dry**

Utility Status

Electric On: Yes
Gas/Oil On: Yes
Water On: Yes

Definitions

ACCEPTABLE	The component/item had no visible defects or evidence of being defective and/or was operational and/or in working condition and/or was performing it's intended function.
	-
MARGINAL	The component/item displayed LIMITATIONS and/or other conditions, such as: being outdated, improper installation, wear, deterioration, damage, material defects, limited remaining useful "life", and/or it appears that the condition may worsen. The component needs monitoring, service, repair and/or replacement.
	-
DEFECTIVE	The component/item has substantial defects now or displayed conditions that could cause it to become defective at any time. Such conditions include: improper installation, not functioning, missing element(s) or component(s), a high degree of wear/deterioration/damage, visible defects, and/or where life, health or safety is in jeopardy. The item/component requires service, repair and/or replacement.
	-
NOT RATED	The component/item was unable to be [fully] inspected due to unsafe conditions, no power supply, was inaccessible, disconnected, was not within the scope of a standard home inspection.
	-
NOT PRESENT	The component/item was not present, not found or was not readily observable.

LEGEND

1. (AD) or (AN) = Address as Desired/Address as needed.
2. (ACC) = Denotes that this item is ACCEPTABLE although it may be grouped with other elements that are down-rated.
3. (AE) or (RE) = ADVISE or REQUIRES EVALUATION and/or remedial options from a QUALIFIED SPECIALIST.
4. (AO) = ASK OWNER about the history of conditions/repairs.
5. (AR) = ANTICIPATE REPAIR or REPLACEMENT NEEDS at any time.
6. (CE) = COMMON ELEMENT; typically, ASSOCIATION maintained. Not part of this inspection, unless noted otherwise.
7. (DA) = Client should DETERMINE personal ACCEPTABILITY.
8. (FN) = Element function is or may be affected by present condition.
9. (HZ) = SUBSTANTIAL HAZARD now and requires immediate correction by a qualified specialist.
10. (HD) = HIDDEN DAMAGE MAY EXIST.
11. (MO) = MONITOR [for changing] conditions and improve as needed.
12. (MR) = Generally, MINOR to REPAIR or correct.
13. (PC) = Advise additional evaluation PRIOR TO CLOSE OF ESCROW and/or SALE/TRANSACTION.
14. (PD) = This condition creates POTENTIAL FOR FUTURE DAMAGE.
15. (PM) = We ADVISE PREVENTIVE MAINTENANCE or the element REQUIRES PREVENTIVE MAINTENANCE as soon as possible to avoid or limit problems.
16. (REPAIR) = In this inspector's opinion, REPAIR is required for normal condition.
17. (REPLACE) = In this inspector's opinion, this element needs to be replaced.
18. (SA) = This condition is a [potential] SAFETY concern. Correction is required.
19. (SY) = This condition is a potential SECURITY concern. Correction is required.
20. (SP) = Advise evaluation by a qualified STRUCTURAL PEST CONTROL OPERATOR, prior to close of escrow/sale/transaction.
21. (UP) = The correction for this condition is considered an UPGRADE relative to the age of the house.
22. ==========

Laundry Room/Area

NOTE: See NOTES at LIVING SPACE section of report.

1. OTHER: **THIS WAS A LIMITED MOLD INSPECTION. LIMITED TO THE AREAS REQUESTED TO BE INSPECTED BY THE CLIENT.**
Specifically, the Laundry Room and Garage ceiling. That being said, any incidental areas that may be directly related to findings in these areas were also inspected. This led me to inspect the garage behind the laundry room and the level 2 hall bathroom above the water damaged ceiling in the garage.

THE INSPECTOR DID NOT INSPECT ANY OTHER AREAS OF THE HOUSE AND DISCLAIMS POSSIBLE UNDISCLOSED AND UNDISCOVERED WATER DAMAGE AND OR MOLD THAT MIGHT EXIST IN OTHER AREAS OF THE HOUSE.

Level 1, Laundry Room/Area

2. DEFECTIVE Walls: Painted Drywall Moisture stains/damage and mold like substance were observed [at the laundry room side of the SE wall of the garage. (Photos 1 and 2).
Also, mold like substance was observed at the underside of the water heater platform.]. Photos 3 and 4.
And moisture damage and possible mold at the the sill plate (framing at the base of the wall) (Photos 5 and 6).
Ask owner about history of conditions.

No Elevated moisture levels detected with moisture meter [ ]. (HD)(RE)(PC).

[Suspect cause of moisture]: Past water heater related leak. It was also reported that there was a pinhole leak in a hot water pipe in the house. I was not told where the actual leak was discovered, but the pipe repair was made at the plumbing manifold in the common wall between the water heater platform and the laundry room.

[Concealed Mold-like conditions may exist here.]
[Suspect Mold-like conditions exist here.]

The best way to determine if mold exists in this area is through microbial sampling.

[Air sampling is recommend in the laundry room.]
AIR Sampling was APPROVED by the client.

[Surface sampling is recommended here at the exposed side of the laundry/garage wall and water heater platform from in the laundry room.
Surface Sampling was APPROVED by the client.

We cannot render a factual conclusion about the presence of mold in an area without scientific testing.

We cannot necessarily determine the extent of any moisture damage and/or mold contamination since this is a non-destructive evaluation.
==========
RESULTS:
AIR SAMPLE ST [1]: Laundry room.

Laundry Room/Area (Continued)

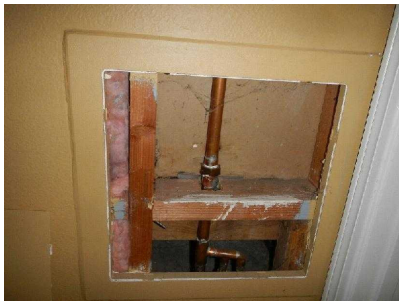
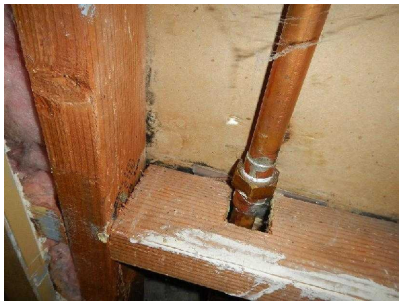
Walls: (continued)

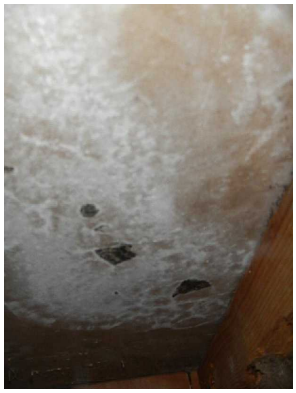
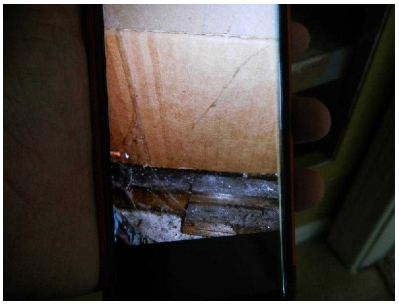
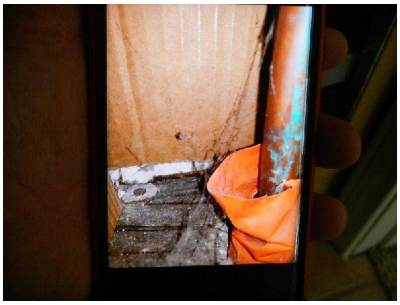
Elevated mold spores and spores not found at the exterior were detected in this area. This indicates a mold problem exists in the air and the source likely originates from this area.

SURFACE SAMPLE DE [1]: Laundry/garage wall and water heater platform.
The surface sample was positive for mold. This clearly indicates that there is a mold problem here.

Appropriate precautions should be used when repairing the moisture damage as concealed mold may be revealed.
I strongly suggest that a professional mold remediator be employed to perform the remediation.]

See the accompanying laboratory mold report.
See the accompanying recommendations report.
==========
Hidden mold growth is possible. If mold is discovered, the work area should be isolated with use of containment barriers. Negative air should be established with use of HEPA filtered negative air machines. Any moisture damaged surfaces that cannot be salvaged, such as gypsum board (aka Sheet rock, Drywall, etc.) should be removed and discarded, to at least 6 to 12 inches beyond where visible moisture damage ends, if practical.
Any water damaged and/or mold impacted structural materials that can be salvaged, should be properly HEPA vacuumed, scrubbed/cleaned, and then HEPA vacuumed again.
The entire work area should be HEPA vacuumed and wet wiped. HEPA air filtration should run for a minimum of 24 hours after the work is complete. If during removal additional mold sources/water damage is noted, remediation/removal should continue until 12 past the last impacted area wherever feasible.

Garage/Carport

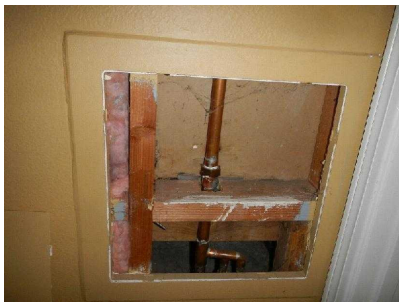
NOTE 1: Insulation and vapor retarder comments are based on a random spot check of visible areas.
NOTE 2: The reversing function of the garage door should be tested and examined frequently, as instructed by the manufacturers and to the satisfaction of the occupant. Great care should be exercised when operating a garage door. It is unsafe to be under or near a moving garage door and any amount of impact or contact can be injurious or damaging.
NOTE 3: GFCI protection is ADVISED at appropriate locations, as per present standards and known safety benefits.
NOTE 4: See NOTES at LIVING SPACE section of report.

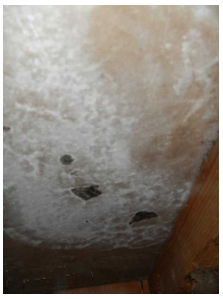
Main, Front Garage

1. Type of Structure: Tuckunder Car Spaces: 2

2. DEFECTIVE Walls: Painted Drywall (Partially repeated from the laundry room):
Moisture stains/damage and mold like substance were observed [at the laundry room side of the SE wall of the garage. Also, mold like substance was observed at the underside of the water heater platform.].
Ask owner about history of conditions.

See Laundry room wall comments.





3. DEFECTIVE Ceiling: Painted Drywall Moisture stains/damage and were observed [at the ceiling, from left to right, across virtually the whole ceiling. The heaviest concentration of water damage was at the north corner area.]. Ask owner about history of conditions.

[No] Elevated moisture levels detected with moisture meter [ ]. (HD)(RE)(PC).

[Suspect cause of moisture]: Reportedly a past leak from the overflow drain at the level 2 hall bathtub. (This seems to be the exact location by measurement).
(Note: the plumber ran the tub water for quite a while and we both monitored the ceiling in the garage below, and no leak was detected in a more than reasonable time frame, inspecting to the best of our ability.).

[Concealed Mold-like conditions may exist here.]

The best way to determine if mold exists in this area is through microbial sampling.

A garage "interior area" sample was not recommended at this time because the garage door has been opened too many times and left open for too long by other activities going on in the home prior to and during my arrival. Generally air samples are not taken in the garage because they are not the living space, though sometimes controlled air samples in a garage may be useful.

Sample 1.
[A ceiling cavity (aka "wall cavity") Air sample is recommend here at the north ceiling.]

Garage/Carport (Continued)

Ceiling: (continued)

The wall cavity Air Sample was APPROVED by the client.
[See Attachment "A".]

[Surface sampling was not recommended at this time as suspect mold was not readily visible, however, concealed mold may exist.]
==========
Sample 2.
[Room Air sampling is recommend in the level 2 hall bathroom because it is above and connected to the water damaged ceiling in the garage and this is the area where the leak reportedly originated.]
AIR Sampling was APPROVED by the client.
[See Attachment "A".]
==========
We cannot render a factual conclusion about the presence of mold in an area without scientific testing.

We cannot necessarily determine the extent of any moisture damage and/or mold contamination since this is a non-destructive evaluation.
==========
RESULTS:
Sample 1. Wall cavity air sample WC1: Garage north ceiling.
The ceiling (wall) cavity air sample results were within normal tolerances. Therefore, I can say with reasonable certainty that there is not an airborne mold problem in this area. This is not absolute certainty that mold does not exist in this space.

Appropriate precautions should be used when repairing the moisture damage as concealed mold may be revealed.
I advise that a professional mold remediator be employed to perform the remediation (repair).]
==========
Results sample 2. Level 2 hall bathroom:
MODERATE AIR SAMPLE RESULTS:
The air sampling MoldSCORE indicated the possibility of mold growth indoors. Generally, a MODERATE level means that the results are inconclusive, and suggests that a more detailed inspection may make sense if there are any other reasons to believe that mold growth could be a problem in this location. Indoor mold growth is a possibility, but was not confirmed in the areas sampled at the time of the inspection. Factors such as recent cleaning, HVAC cycles, high winds, rain, or other indoor or outdoor conditions could have contributed to a MODERATE result in the absence of indoor mold growth.

If mold growth is found, regardless of the magnitude of the growth, it is recommended that the growth be physically removed using appropriate controls and precautions. If mold has been located and removed, it is also important to identify and correct the source of moisture or dampness that allowed the mold to grow. If the affected area becomes moist again, mold growth will occur again.
We recommend that you consult a professional if you are not familiar with how to locate and safely remove mold growth or how to identify and correct moisture problems that may exist.
Mold is a living organism that can grow very rapidly under certain conditions. If any portion of the room tested is, or has been, damp for an extended period since the time of testing, the likelihood of mold growth may have increased substantially since the time of the inspection.

Garage/Carport (Continued)

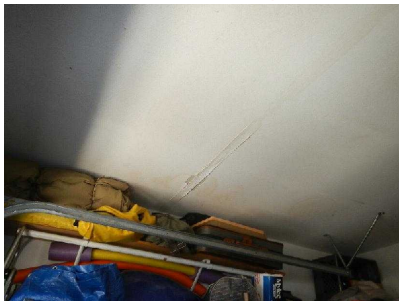
Ceiling: (continued)

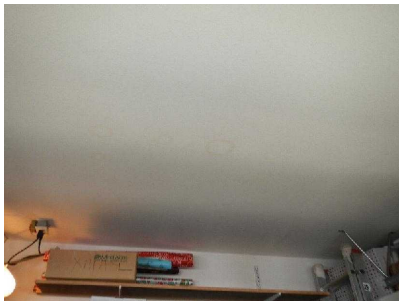
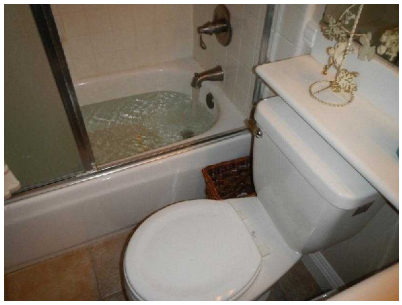
==========

See the accompanying laboratory mold report.
See the accompanying recommendations report.

==========

Hidden mold growth is possible. If mold is discovered, the work area should be isolated with use of containment barriers. Negative air should be established with use of HEPA filtered negative air machines. Any moisture damaged surfaces that cannot be salvaged, such as gypsum board (aka Sheet rock, Drywall, etc.) should be removed and discarded, to at least 6 to 12 inches beyond where visible moisture damage ends, if practical.
Any water damaged and/or mold impacted structural materials that can be salvaged, should be properly HEPA vacuumed, scrubbed/cleaned, and then HEPA vacuumed again.
The entire work area should be HEPA vacuumed and wet wiped. HEPA air filtration should run for a minimum of 24 hours after the work is complete. If during removal additional mold sources/water damage is noted, remediation/removal should continue until 12 past the last impacted area wherever feasible.



Plumbing

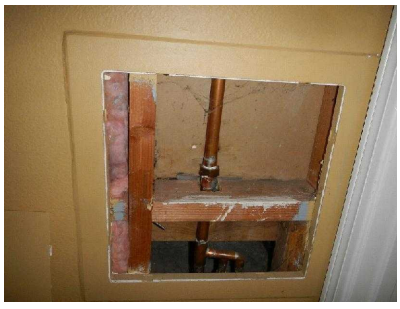
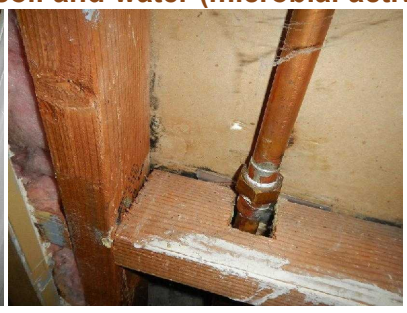
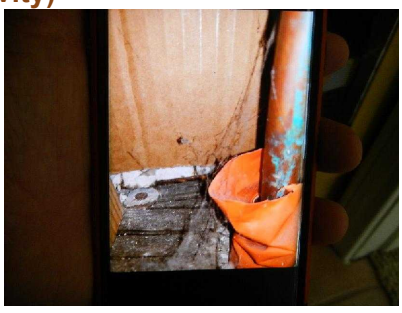
NOTE 1: Evaluation of plumbing components is limited to readily accessible areas and limited testing due to typical construction constraints. We cannot duplicate normal usage conditions. We cannot evaluate the condition or flow through covered and/or underground Water Supply, Drain, Waste or Vent lines/components. Older sewer lines are subject to deterioration, blockage and/or tree root damage. Even newer homes may have construction defects that are concealed or have not revealed themselves yet. We advise having a video sewer inspection prior to close of the real estate transaction, regardless of age or lack of negative comments. See comments at other plumbing fixtures/components within the report.
NOTE 2: Material representations are based on predominant and readily visible components.
NOTE 3: Water treatment systems such as Water Softeners and Filters must be assessed by qualified specialists.
NOTE 4: Comments regarding Gas/Fuel piping are based on readily visible conditions.
NOTE 5: The true main water shut-off is always at the meter unless special circumstances dictate otherwise.

1. NOT RATED

Water Supply Distribution Pipes (as viewed): * See Note 1, above. *Copper type where visible. * See Note 1, above* **a. There has been at least one reported water supply pipe leak.**
Be advised that that copper pipes have been known to fail with pin hole leaks as it starts to age and due to Chloramine additives from the water utility company and minerals from "hard" water. (AE)(PC).

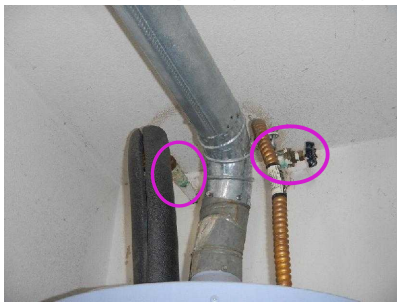
**** I observed other problematic conditions regarding the copper plumbing:**
In the lower wall between the water heater and laundry room the there is excessive flux still on a water pipe. My visibility was extremely limited. (See photo 3).
Also, there is calcification at the hot water pipe above the water heater and also at the cold water supply valve and sweated fitting. (Photos 4 and 5).
==========
1. The #1 reason why copper pipes leak is due to turbulence. Turbulence enters your system in 2 ways:
a. Velocity: Plumbing code limits the velocity within your piping system to 8 fps (feet per second) for cold water and 5 fps for hot water. Limiting the velocity reduces the turbulence in the pipes that creates pinholes.
b. Fittings that are too close together: Fittings that are too close together increase turbulence, which causes pinhole leaks. When fittings are too close together, turbulence in the water flow increases, which means the water grates against the inside wall of the pipe causing it to leak.

2. Another reason why copper pipes leak is what's called pitted corrosion, an extremely localized type of corrosion that attacks small areas on the inside surface of copper pipes. Well, there has not been a conclusive study on what causes pitted corrosion, here are some possible theories:
- High levels of chlorine in the water supply
- Corrosion particles from rusted water heaters
- High water pressure
- High pH levels in the water
- Other chemical factors in soil and water (microbial activity)

Plumbing (Continued)

Water Supply Distribution Pipes (as viewed): * See Note 1, above. (continued)




Whole House Water Heater

2. **Heater Location:** *Garage*
3. **Type/Design Life:** *Natural Gas Heated / 8-12 years.* **Est. Age:** *15+-*
4. **Manufacturer:** **Est. Capacity:** *50 Gal.*
5. DEFECTIVE **Overall System Condition:** a. The reason I am discussing the water heater here is because I have special knowledge about water heaters and their installation and the age and installation can be related to potential future water damage. The relevance of the water damage requires that the water heater be removed to access, remove and replace water damaged materials.
   ==========
   b. The water heater is DOWN-RATED due to age, installation and conditions noted below. Advise obtaining remedial options from a licensed plumber. See comments below.
6. MARGINAL **Seismic Restraint:** STRAP at LOWER part of tank should be at least 4" above the gas controller, And in the lower 1/3 of the tank, if possible. Less than 4" now. Some tanks' dimensions do not allow the strap to be 4" above the controller and be in the lower 1/3. It is my opinion that this is an oversight in the installation "requirements". It is my opinion that it is more important to have clearance from the controller, but you should inquire of a qualified plumber and the local building department to see what they recommend.
7. MARGINAL **Flue Pipe:** MISSING SCREWS at [vent joints] and [draft hood]. There should be three screws per joint. Potential for separating and is a safety concern.
8. ACCEPTABLE **TPRV and Discharge Tube:**
9. MARGINAL **Fuel Line:** A sediment trap was NOT present/observed in fuel line. A sediment trap (AKA Drip leg) is required by the manufacturer and by the local authority having jurisdiction. (RE)(PC).
10. DEFECTIVE **Platform/Support:** a. The water heater platform was water damaged and has mold at the underside as viewed from the laundry room access. The water heater needs to be removed to replace this sheetrock at the underside of the platform and probably the plywood platform.

    b. A CATCH PAN was not present under the water heater. Advise installing a water catch pan with appropriate drainage provisions to avoid water damage to the surrounding wood framed construction and the adjacent walls, in the event of a leak.
    A pan or other suitable protection is required, "...where water damage may occur from a leaking water heater". (The water heater would need to be emptied and disconnected to install the catch pan, which is basically the same as removing the water heater.).
11. ACCEPTABLE **Combustion air source:**

Structure

NOTE 1: This report is not an engineering evaluation of the structure.
NOTE 2: Slab comments in this section pertain to slab on grade construction at living spaces/habitable areas only. See slab/floor comments at other sections of report. Slab foundations are particularly prone to movement in areas with expansive soil.
NOTE 3: The presence of floor coverings limits the ability to fully assess slab and sub-floor conditions.
NOTE 4: Sub-grade areas are prone to moisture and insect concerns; evaluations are limited due to restricted access.
NOTE 5: Client should confirm presence of inspection permits/approvals for finished areas.
NOTE 6: See NOTES at LIVING SPACE section of report.

1. ACCEPTABLE **Pre-1978 Constn. (Reportedly):** NO. Pre-1978 construction; Painted surfaces may contain Lead Paint. Any damage, repairs or removal should be addressed accordingly.

2. ACCEPTABLE **Pre-1980 Constn. (Reportedly):** NO. Pre-1980 construction. Textured ceiling material, flooring, HVAC components, insulation and other construction materials may contain Asbestos. Any repairs or removal should be addressed accordingly.

3. **Framing Type:** Wood frame

4. **Foundation Type:** Poured concrete slab on grade.

SUPPLEMENTAL MOLD INFORMATION

1. .0 Sampling Methodologies

*Air Samples:
Air sampling for total fungi is designed to count and identify the presence of total fungal material (i.e. cultureable and non-cultureable spores) in a measured volume of air. The air samples are collected via the spore trap method with the use of a Zefon Air-O-Cell. Airflow through the cassette is produced by an electrically powered air-sampling device set and calibrated to a flow rate of 15 liters per minute. The sample cassettes are then sealed and submitted to the laboratory via a chain of custody for analysis.
.0 Sampling Methodologies

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AN OUTDOOR AIR SAMPLE, ALSO ANALYZED BY THE LAB, IS NECESSARY AS A BASELINE FOR COMPARISON TO SEE WHAT IS NORMAL FOR THE IMMEDIATE OUTDOOR ENVIRONMENT. DEPENDING ON THE SIZE OF THE BUILDING AND OUTDOOR ENVIRONMENT, LANDSCAPING & VEGETATION, IT MAY BE NECESSARY TO SAMPLE MULTIPLE AREAS AT THE EXTERIOR OF THE BUILDING. THIS IS AT THE DISCRETION OF THE MOLD INSPECTION TECHNICIAN IN COROBORATION WITH THE CLIENT.

*Wall/Ceiling Cavity Samples:
Cavity samples are collected by drilling a small (1/4") hole into the drywall or other material, then inserting a plastic tube into the hole through which an air sample is pulled. The cavity air sample is collected using the same media and method as stated above for standard air sampling.

*Surface Swab Samples:

SUPPLEMENTAL MOLD INFORMATION (Continued)

Surface swab samples are collected using sterile swabs enclosed in sterile tubes which contain a transport media solution. These samples are collected by moistening the swab with the provided solution and then swabbing the suspect area. The swabs are then inserted into the sterile tubes, sealed, and submitted to the laboratory via a chain of custody for analysis.

*Surface Tape Samples:
Surface tape samples collected using a forensic tape lift kit. These samples are collected by pressing the tape media slide to the surface of a building material.
The Bio-Tape slide is then sealed in its included case and submitted to the laboratory via a chain of custody for analysis.

Note: If samples were collected, all samples collected from the site were submitted for laboratory analysis under a chain of custody to an independent, AIHA certified lab as recommended by the U.S. Environmental Protection Agency. For additional detailed information on the sample results, please see the laboratory report attached as an appendix at the end of this Report.

1.2 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).

1.3 Moisture Content Readings:
A moisture meter was utilized on this project to measure the moisture content (MC) of certain building materials (walls, ceilings, flooring, etc.) throughout the structure, especially areas suspect of water intrusion. Measurement and recording of MC is performed to detect building materials containing unacceptable levels of moisture (greater than 15% MC in wood) or elevated MC in other materials, relative to similar materials in undamaged areas of the structure.
Fungal growth requires moisture, a food source, and fungal spores. Thus, wood and building materials that are continuously dry (MC less than 15%) should not promote microbial growth.
When a non-penetrating moisture meter is used, levels are reported as a color rather than a percentage. Following is a description of the colors used:
* Green - Air-dry conditions
* Yellow - Slightly in excess of normal or inconclusive
* Red - Excessive moisture

In order to avoid fungal growth, it is recommended that the MC of construction wood products be below 15%. MC readings of "Green" indicated readings believed to be below 15%. MC Readings of "Red" indicated conditions believed to be above 15% moisture.
Construction materials with elevated MC are likely to promote fungal growth. It is recommended that the source of moisture be located and corrected immediately.
NOTE: When a moisture meter is used in a non-penetrating manner, it is possible to obtain a reading of "Red" 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 used as a guide for further testing and investigation.

1.4 Note: Unidentified Odors:

SUPPLEMENTAL MOLD INFORMATION (Continued)

Some compounds produced by molds are volatile and are released directly into the air. These are known as Microbial Volatile Organic Compounds (mVOCs). Because these compounds often have strong and/or unpleasant odors, they can be the source of odors associated with molds. Exposure to mVOCs from molds has been linked to symptoms such as headaches, nasal irritation, dizziness, fatigue, and nausea. Research on MVOCs is still in the early phase. –US Environmental Protection Agency

Section 2.0 Recommendations

2.1 General Recommendations

2.1.a Engage a licensed professional to evaluate and repair, as necessary, the items related to water intrusion in the structure.
NOTE: MOLD GROWTH IS HIGHLY LIKELY TO RETURN IF MOISTURE INTRUSION ISSUES ARE NOT CORRECTED.

2.1.b Engage a professional water restoration company to dry out, in accordance with the IICRC S500, the areas noted to be wet.
NOTE: Use caution when drying out wet areas. Contact 20/20 Advanced Property & Mold Inspections if visible mold growth is seen inside wall or ceiling cavities or under or behind cabinetry. If mold growth is discovered during dry-out process, proper engineering controls should be put into place to prevent the spreading of airborne mold spores. These engineering controls include, mold growth is discovered during repairs or remodeling, but are not limited to the use of HEPA filtered negative pressure containment chambers, bagging of contaminated materials, and proper demolition processes. Inform contractors of the possibility of hidden mold growth. If work is being performed by a contractor that is not certified/licensed in mold remediation, inform the contractor that they should stop work if mold is discovered. Contact 20/20 APMI.

2.1.c Engage a licensed professional to evaluate and repair, as necessary, the noted preventative maintenance items related to water intrusion as noted in the Preventative Maintenance section of the report above.

2.1.d If any discoloration, staining, water damage, or visible mold-like growth is observed during remodeling or renovations of the structure, or observed when moving furniture or other items, it is recommended that the client consult with a mold inspection professional.

2.2 Recommendations Regarding Remediation:
Remediation should be performed to the standards found in IICRC S520, Standard and Reference Guild for Mold Remediation. It is critical that only trained and qualified mold remediation professionals perform the clean-up work. Proper engineering controls must be in place to prevent the further spreading of airborne mold spores. These engineering controls include, but are not limited to, bagging of contaminated materials; use of HEPA filtered negative pressure containment chambers, and proper demolition processes.

2.2.a Engage a qualified, licensed Mold Remediation Contractor to remediate the following areas:
Laundry room wall and air, the garage water heater platform and related.
Garage ceiling & related (Level 2 hall bathroom).
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3.0 Notes about Remediation

3.1.a All remediated areas should be contained or sealed off from the rest of the home so as to prevent the spreading

SUPPLEMENTAL MOLD INFORMATION (Continued)

of airborne molds to the rest of the home.

3.1.b When removing wall/ceiling surfaces, cabinetry, or baseboards, the underlying cavities and building materials should be inspected for additional hidden mold growth. Contaminated wall/ceiling surfaces and other materials should be removed, if feasible, at least one foot in all directions past the last appearance of mold growth.
3.1.c Any moldy or water damaged insulation or other non-structural building materials must also be removed and disposed of.
3.1.d Mold and water damaged materials should be immediately placed in plastic bags and sealed for disposal.
3.1.e Mold growth found on structural surfaces within the exposed wall/ceiling cavities should be cleaned/removed from all surfaces. This typically involves the use of HEPA vacuums, wet scrubbing, sanding, wire brushing, and/or wiping/drying with disposable wipes.
3.1.f HEPA filtration and dehumidification equipment should be used in all affected areas. HEPA filtration is needed in order to return the airborne particulate levels inside the home back to normal.
3.1.g After the remediation (BEFORE new materials are installed), the remediation project should be re-inspected and approved by a Mold Assessment Consultant. The re-inspection should include testing for mold spore contamination and building material moisture levels.
The processes outlined here are the minimum steps required for remediation. The remediation firm may take additional or varied steps as dictated by their judgment and/or operating procedures to adequately abate the mold contamination. In mold remediation situations, it is always possible that additional hidden mold growth may exist in the walls beyond the areas investigated.

3.1.h HVAC SYSTEM - Engage a mold remediation professional or other qualified professional to perform invasive exploration in the HVAC Closet. Any time water infiltrates ceilings or wall cavities or under/behind cabinetry mold growth is possible. Hidden mold growth is possible in the walls surrounding the HVAC unit and underneath the unit platform. If mold growth is found inside the wall cavities or underneath the unit, remediation will be required. Proper engineering controls should be used to prevent the spreading of airborne mold spores during the exploration.

3.1.i Hidden mold growth is possible in the areas listed above. Consider engaging a mold remediation professional or other qualified professional to perform invasive exploration in these areas. If mold growth is found inside a wall or ceiling cavity or under/behind cabinetry, etc., all affected materials should be removed if not salvageable, according to the IICRC S520 - 2006, Standard and Reference Guide for Professional Water Damage Restoration. Proper engineering controls should be used to prevent the spreading of airborne mold spores during the exploration.

Summary

Laundry Room/Area

1. Level 1, Laundry Room/Area Walls: Painted Drywall Moisture stains/damage and mold like substance were observed [at the laundry room side of the SE wall of the garage. (Photos 1 and 2).
Also, mold like substance was observed at the underside of the water heater platform.]. Photos 3 and 4. And moisture damage and possible mold at the the sill plate (framing at the base of the wall) (Photos 5 and 6).
Ask owner about history of conditions.

No Elevated moisture levels detected with moisture meter [ ]. (HD)(RE)(PC).

[Suspect cause of moisture]: Past water heater related leak. It was also reported that there was a pinhole leak in a hot water pipe in the house. I was not told where the actual leak was discovered, but the pipe repair was made at the plumbing manifold in the common wall between the water heater platform and the laundry room.

[Concealed Mold-like conditions may exist here.]
[Suspect Mold-like conditions exist here.]

The best way to determine if mold exists in this area is through microbial sampling.

[Air sampling is recommend in the laundry room.]
AIR Sampling was APPROVED by the client.

[Surface sampling is recommended here at the exposed side of the laundry/garage wall and water heater platform from in the laundry room.
Surface Sampling was APPROVED by the client.

We cannot render a factual conclusion about the presence of mold in an area without scientific testing.

We cannot necessarily determine the extent of any moisture damage and/or mold contamination since this is a non-destructive evaluation.
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RESULTS:
AIR SAMPLE ST [1]: Laundry room.
Elevated mold spores and spores not found at the exterior were detected in this area. This indicates a mold problem exists in the air and the source likely originates from this area.

SURFACE SAMPLE DE [1]: Laundry/garage wall and water heater platform.
The surface sample was positive for mold. This clearly indicates that there is a mold problem here.

Appropriate precautions should be used when repairing the moisture damage as concealed mold may be revealed.
I strongly suggest that a professional mold remediator be employed to perform the remediation.]

See the accompanying laboratory mold report.
See the accompanying recommendations report.
==========

Summary (Continued)

Walls: (continued)

Hidden mold growth is possible. If mold is discovered, the work area should be isolated with use of containment barriers. Negative air should be established with use of HEPA filtered negative air machines. Any moisture damaged surfaces that cannot be salvaged, such as gypsum board (aka Sheet rock, Drywall, etc.) should be removed and discarded, to at least 6 to 12 inches beyond where visible moisture damage ends, if practical.
Any water damaged and/or mold impacted structural materials that can be salvaged, should be properly HEPA vacuumed, scrubbed/cleaned, and then HEPA vacuumed again.
The entire work area should be HEPA vacuumed and wet wiped. HEPA air filtration should run for a minimum of 24 hours after the work is complete. If during removal additional mold sources/water damage is noted, remediation/removal should continue until 12 past the last impacted area wherever feasible.

Garage/Carport

2. Main, Front Garage Walls: Painted Drywall (Partially repeated from the laundry room):
Moisture stains/damage and mold like substance were observed [at the laundry room side of the SE wall of the garage. Also, mold like substance was observed at the underside of the water heater platform.].
Ask owner about history of conditions.

See Laundry room wall comments.

3. Main, Front Garage Ceiling: Painted Drywall Moisture stains/damage and were observed [at the ceiling, from left to right, across virtually the whole ceiling. The heaviest concentration of water damage was at the north corner area.]. Ask owner about history of conditions.

[No] Elevated moisture levels detected with moisture meter [ ]. (HD)(RE)(PC).

[Suspect cause of moisture]: Reportedly a past leak from the overflow drain at the level 2 hall bathtub. (This seems to be the exact location by measurement).
(Note: the plumber ran the tub water for quite a while and we both monitored the ceiling in the garage below, and no leak was detected in a more than reasonable time frame, inspecting to the best of our ability.).

[Concealed Mold-like conditions may exist here.]

The best way to determine if mold exists in this area is through microbial sampling.

A garage "interior area" sample was not recommended at this time because the garage door has been opened too many times and left open for too long by other activities going on in the home prior to and during my arrival.
Generally air samples are not taken in the garage because they are not the living space, though sometimes controlled air samples in a garage may be useful.

Sample 1.
[A ceiling cavity (aka "wall cavity") Air sample is recommend here at the north ceiling.]
The wall cavity Air Sample was APPROVED by the client.
[See Attachment "A".]

[Surface sampling was not recommended at this time as suspect mold was not readily visible, however, concealed mold may exist.]

Summary (Continued)

Ceiling: (continued)

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Sample 2.
[Room Air sampling is recommend in the level 2 hall bathroom because it is above and connected to the water damaged ceiling in the garage and this is the area where the leak reportedly originated.]
AIR Sampling was APPROVED by the client.
[See Attachment "A".]

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We cannot render a factual conclusion about the presence of mold in an area without scientific testing.

We cannot necessarily determine the extent of any moisture damage and/or mold contamination since this is a non-destructive evaluation.

==========

RESULTS:
Sample 1. Wall cavity air sample WC1: Garage north ceiling.
The ceiling (wall) cavity air sample results were within normal tolerances. Therefore, I can say with reasonable certainty that there is not an airborne mold problem in this area. This is not absolute certainty that mold does not exist in this space.

Appropriate precautions should be used when repairing the moisture damage as concealed mold may be revealed. I advise that a professional mold remediator be employed to perform the remediation (repair).]

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Results sample 2. Level 2 hall bathroom:
MODERATE AIR SAMPLE RESULTS:
The air sampling MoldSCORE indicated the possibility of mold growth indoors. Generally, a MODERATE level means that the results are inconclusive, and suggests that a more detailed inspection may make sense if there are any other reasons to believe that mold growth could be a problem in this location. Indoor mold growth is a possibility, but was not confirmed in the areas sampled at the time of the inspection. Factors such as recent cleaning, HVAC cycles, high winds, rain, or other indoor or outdoor conditions could have contributed to a MODERATE result in the absence of indoor mold growth.

If mold growth is found, regardless of the magnitude of the growth, it is recommended that the growth be physically removed using appropriate controls and precautions. If mold has been located and removed, it is also important to identify and correct the source of moisture or dampness that allowed the mold to grow. If the affected area becomes moist again, mold growth will occur again.
We recommend that you consult a professional if you are not familiar with how to locate and safely remove mold growth or how to identify and correct moisture problems that may exist.
Mold is a living organism that can grow very rapidly under certain conditions. If any portion of the room tested is, or has been, damp for an extended period since the time of testing, the likelihood of mold growth may have increased substantially since the time of the inspection.

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See the accompanying laboratory mold report.
See the accompanying recommendations report.

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Hidden mold growth is possible. If mold is discovered, the work area should be isolated with use of containment barriers. Negative air should be established with use of HEPA filtered negative air machines. Any moisture damaged

Summary (Continued)

Ceiling: (continued)

surfaces that cannot be salvaged, such as gypsum board (aka Sheet rock, Drywall, etc.) should be removed and discarded, to at least 6 to 12 inches beyond where visible moisture damage ends, if practical.
Any water damaged and/or mold impacted structural materials that can be salvaged, should be properly HEPA vacuumed, scrubbed/cleaned, and then HEPA vacuumed again.
The entire work area should be HEPA vacuumed and wet wiped. HEPA air filtration should run for a minimum of 24 hours after the work is complete. If during removal additional mold sources/water damage is noted, remediation/removal should continue until 12 past the last impacted area wherever feasible.

Plumbing

4. **Water Supply Distribution Pipes (as viewed): * See Note 1, above.** *Copper type where visible. * See Note 1, above* **a. There has been at least one reported water supply pipe leak.**
Be advised that that copper pipes have been known to fail with pin hole leaks as it starts to age and due to Chloramine additives from the water utility company and minerals from "hard" water. (AE)(PC).

**** I observed other problematic conditions regarding the copper plumbing:**
In the lower wall between the water heater and laundry room the there is excessive flux still on a water pipe. My visibility was extremely limited. (See photo 3).
Also, there is calcification at the hot water pipe above the water heater and also at the cold water supply valve and sweated fitting. (Photos 4 and 5).
==========
1. The #1 reason why copper pipes leak is due to turbulence. Turbulence enters your system in 2 ways:
a. Velocity: Plumbing code limits the velocity within your piping system to 8 fps (feet per second) for cold water and 5 fps for hot water. Limiting the velocity reduces the turbulence in the pipes that creates pinholes.
b. Fittings that are too close together: Fittings that are too close together increase turbulence, which causes pinhole leaks. When fittings are too close together, turbulence in the water flow increases, which means the water grates against the inside wall of the pipe causing it to leak.

2. Another reason why copper pipes leak is what's called pitted corrosion, an extremely localized type of corrosion that attacks small areas on the inside surface of copper pipes.
Well, there has not been a conclusive study on what causes pitted corrosion, here are some possible theories:
- High levels of chlorine in the water supply
- Corrosion particles from rusted water heaters
- High water pressure
- High pH levels in the water
- Other chemical factors in soil and water (microbial activity)

5. **Whole House Water Heater Overall System Condition:** a. The reason I am discussing the water heater here is because I have special knowledge about water heaters and their installation and the age and installation can be related to potential future water damage. The relevance of the water damage requires that the water heater be removed to access, remove and replace water damaged materials.
==========
b. The water heater is DOWN-RATED due to age, installation and conditions noted below. Advise obtaining remedial options from a licensed plumber. See comments below.

6. **Whole House Water Heater Seismic Restraint:** STRAP at LOWER part of tank should be at least 4" above the gas controller, And in the lower 1/3 of the tank, if possible. Less than 4" now. Some tanks' dimensions do not allow the strap to be 4" above the controller and be in the lower 1/3. It is my opinion that this is an oversight in the installation "requirements". It is my opinion that it is more important to have clearance from the controller, but you should inquire of a qualified plumber and the local building department to see what they recommend.

Summary (Continued)

7. **Whole House Water Heater Flue Pipe:** MISSING SCREWS at [vent joints] and [draft hood]. There should be three screws per joint. Potential for separating and is a safety concern.
8. **Whole House Water Heater Fuel Line:** A sediment trap was NOT present/observed in fuel line. A sediment trap (AKA Drip leg) is required by the manufacturer and by the local authority having jurisdiction. (RE)(PC).
9. **Whole House Water Heater Platform/Support:** a. The water heater platform was water damaged and has mold at the underside as viewed from the laundry room access. The water heater needs to be removed to replace this sheetrock at the underside of the platform and probably the plywood platform.

   b. A CATCH PAN was not present under the water heater. Advise installing a water catch pan with appropriate drainage provisions to avoid water damage to the surrounding wood framed construction and the adjacent walls, in the event of a leak. A pan or other suitable protection is required, "...where water damage may occur from a leaking water heater".
   (The water heater would need to be emptied and disconnected to install the catch pan, which is basically the same as removing the water heater.).