

# MOULD AND MOISTURE ASSESSMENT

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Client Name: **Mitchell Watts**  
Street: **9 Wildthorn Avenue**  
Suburb: **Dural**  
Postcode: **2158**  
Assessment Date: **Friday 27th March 2026 10:00am**

Conducted by: **Joanne Lia - Principal Building Biologist**  
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On average we spend up to 90% of our time indoors (Klepeis et al 2001). According to the EPA (1987) our indoor environment is two to five times more toxic than our outdoor environment. Most people don't consider the fact that our homes or workplaces can negatively impact our health. Building Biology is the evaluation and control of health hazards in the built environment. This involves assessing the home for allergens, toxicants, electromagnetic fields and biotoxins unique to a water-damaged building and providing strategies to address exposure and/or source control and abatement.

There are many sources of indoor air pollution. Water damaged buildings (WDB) are a major contributor to poor indoor air quality.

In a WDB there is an increase in water activity from leaks, flooding or other sources of moisture. The increase in water activity "aw" will lead to changes in the normal ecology of the microbial environment. If the building was not mechanically dried in an appropriate amount of time and was left to dry naturally then the problem is exacerbated, with potentially damaging effects on building materials and the quality of the indoor air (Cole et al. 1999)

A WDB is contaminated by microbes such as mould and their mycotoxins, bacteria and their endotoxins and many other toxics. This combination of biological and chemical exposures can place stress on the body and contribute to adverse health effects.

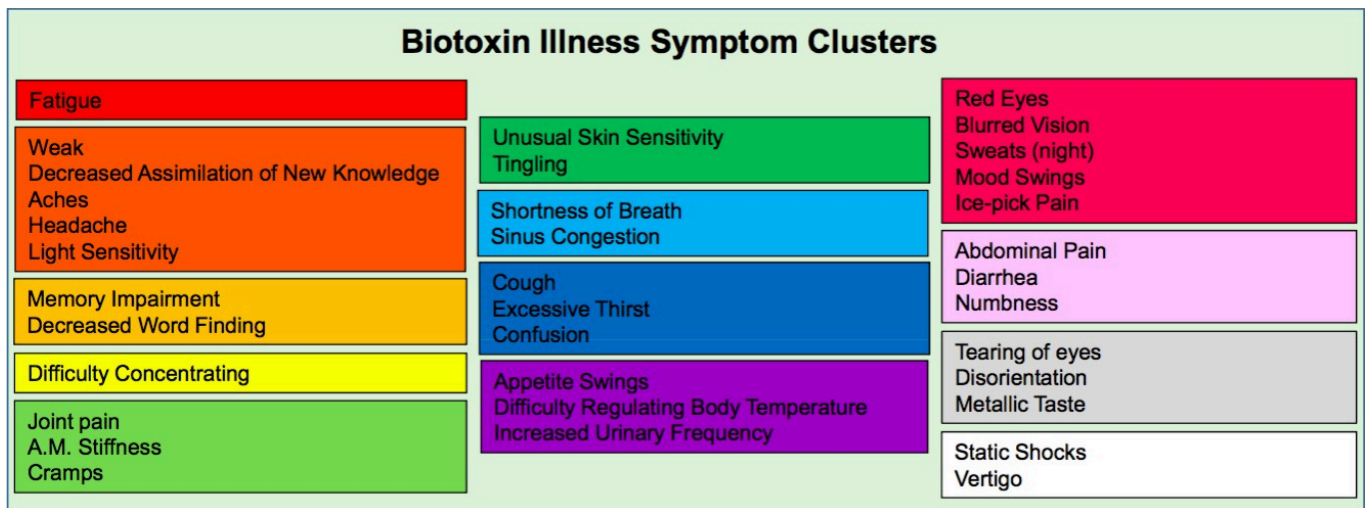
### HEALTH IMPLICATIONS OF MOULD AND DAMP

A vast body of peer reviewed evidence shows the link between living in damp buildings and the consequent adverse health issues. The National Academies of Science (2004) published a comprehensive review of the literature and concluded that "...excessive indoor dampness is a public health problem." Mendell et al (2011) found that evidence from epidemiologic studies and meta-analyses showed indoor dampness or mould to be associated consistently with increased asthma development and exacerbation.

Moulds produce health effects through inflammation, allergy, toxicity and occasionally infection. Allergic reactions are most common following mould exposure. Typical symptoms that mould exposed people report (alone or in combination) include:

- Respiratory problems, such as wheezing, difficulty breathing, shortness of breath, bronchitis, hypersensitivity pneumonitis, (Fisk et al 2010)
- Nose or throat irritation, Dry, hacking cough, recurrent flu like symptoms, Nasal and sinus congestion, Allergic Rhinitis (Health Canada 2004)
- Blurred vision, red or watering eyes
- Skin rashes or irritation such eczema
- Headaches, memory problems, mood swings, depression
- Nosebleeds, body aches and pains, and fever (Shoemaker et al 2010)

People's response to mould is individual. For some people, a relatively small number of mould spores or fragments can trigger an asthma attack or lead to other health problems. For others, symptoms may occur only when exposure levels are much higher. This can vary depending on an individual's genetic makeup and immune function. About 24% of people have a genetic susceptibility to develop biotoxin illness or Chronic Inflammatory response Syndrome (CIRS). For susceptible individuals mould can affect any system of the body which is why there are so many varying symptoms related to mould exposure. Dr Ritchie Shoemaker developed a CIRS symptom cluster to help identify when someone is suffering from biotoxin illness. Aside from the symptoms mentioned above other less well-known symptoms include:



One symptom in at least six of the thirteen symptom clusters is required to be considered for CIRS. Eight of thirteen symptom clusters indicate a high probability of CIRS. (Shoemaker 2011)

Exposure to mould is not healthy for anybody and high moisture conditions should be addressed immediately to prevent excessive mould growth and health problems developing.

Certain moulds are more problematic than others. People with allergies vary in their sensitivities to mould, both as to the amount and the types to which they react. In addition to their allergic properties, certain types of moulds may produce compounds that have toxic properties, which are called mycotoxins. Mycotoxins are not always produced, and whether a mould produces mycotoxins while growing in a building depends on what the mould is growing on, conditions such as temperature, pH, humidity or other unknown factors.

At present, there are no legally enforceable numerical standards for acceptable indoor mould levels in Australia. However, a range of recognised guidelines and standards are used to assess indoor environmental conditions:

- ASTM International. D7338-14. (2014). Standard Guide for Assessment of Fungal Growth in Buildings.
- IICRC R520. (2015). Standard and Reference Guide for Professional Mould Remediation. (3rd ed). ANSI/IICRC R520-2015. Institute of Inspection, Cleaning and Restoration Certification. Vancouver, Washington. USA.
- World Health Organisation. (2009). Guidelines for Indoor Air Quality. Dampness and Mould. Copenhagen, Denmark.
- Brandys RC, Brandys GM. (2012). Worldwide exposure standards for mold and bacteria with assessment guidelines for air, water, dust, ductwork, carpet and insulation. (9th ed). OEHCS Inc.IL.
- Brandys RC, Brandys GM. (2011). Post remediation testing and verification for mold and bacteria (4th ed). OEHCS Inc.IL.
- Flannigan B, Samson RA, Miller DJ. (2011). Microorganisms in home and indoor work environments: diversity, health impacts, investigation and control. (2nd ed). CRC Press.
- Kemp H. (2010). Australian Mould Guideline. (2nd ed). Messenger Publishing.

In Australia best practice has been to utilize the “ANSI/IICRC S520” which deals with the contamination after a building has been affected by water ingress or continuing moisture issues.

## BACKGROUND

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NoToxRox Building Biology Services was engaged by the prospective purchasers of 9 Wildthorn Avenue, Dural NSW 2158 to conduct a pre-purchase mould and moisture assessment. The inspection was undertaken on Friday 27th March 2026.

The purpose of the assessment was to investigate concerns regarding potential mould growth within the dwelling and to provide an independent evaluation of indoor environmental conditions prior to purchase. Mould sampling was undertaken as part of the assessment to assist in determining whether airborne mould levels within the property are within normal ranges or indicative of an indoor source.

## SURVEY EQUIPMENT (MOULD & MOISTURE)

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The following equipment was used to conduct the audit.

- Hygrothermometer to assess temperature, Humidity and Dew Point.
- GE Protimeter MMS3 moisture meter.
- FLIR C2 Compact Thermal Imaging Camera...
- Borescope to investigate hard to get to areas.
- Moisture Map, NIOSH tool when necessary.
- Bio Pump to take air samples/ surface tapes and swabs.

NB: Protimeters (moisture meters) are used to take subsurface moisture readings:

REL Mode: This measurement helps us assess if the material is in a dry, borderline or damp condition and to map numerically the extent of the problem. Borderline conditions 185-220REL indicates there is enough moisture to support mould growth and damp/saturated conditions >220REL indicate there is a problem which requires further investigation.

WME Mode: wood moisture equivalent assessed by inserting pins into the building material. This is the theoretical %mc value that would be attained by a piece of wood in contact with and in moisture equilibrium with the material under test. Protimeter WME measurements can be used directly to establish if non-conductive materials are in a dry, at risk or damp condition

17-19%WME indicates the material is at risk / borderline

>20% WME indicates the material is damp.

\*When using a concrete meter above 60% CME is considered damp.

## ASSESSMENT METHODOLOGY

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### Visual Inspection

NoToxRox conducted a visual inspection of the specified areas of the site. The inspection assessed:

Visible mould growth	Sources of water and/or moisture ingress
Odours indicative of mould (mVOCs)	Signs of condensation and/or dampness
Dust and debris	Evidence of previous repairs
Water staining on building materials	Observation of pre-existing conditions if relevant

## Moisture Assessment

A self-calibrating Protimeter MMS3 and Reachmaster PRO moisture measurement system was used to evaluate the moisture content in building materials. The MMS3 offers:

- **Pin Mode:** Measures percentage wood moisture equivalent (WME) from 6% to 100% (readings above 30% are relative).
- **Non-Invasive (RF) Mode:** Provides relative moisture readings ranging from 60 to 999, penetrating up to 19 mm in standard mode and up to 12 cm in sensitivity mode, depending on the material under test.

The Protimeter provides an initial indication of areas that may require further investigation. In alignment with Section 5.4 of the ANSI/IICRC S520, representative testing was performed on materials such as timber and plasterboard, comparing affected areas with unaffected reference points to identify materials retaining excessive moisture levels. These readings establish target drying goals or dry standards for comparison. The Protimeter provides only a representative assessment and may not detect all potential moisture sources.

## Psychrometric Measurements

The MMS3 also measures relative humidity (RH), temperature, dew point and surface temperature, surface proximity to dew point condensation and grains per pound as well as multiple psychrometric calculations.

- **IR Surface Temperature Probe:**
  - Laser Pointer with 12:1 (D:S) ratio
  - Temperature range: -20°C to 80°C, accuracy: ±2°C
- **QuickStick Data (Nominal):**
  - Relative Humidity (RH): 0% to 10% RH (±3% RH at 20°C), 10% to 90% RH (±2% RH at 20°C)
  - Temperature range: 0°C to 50°C, accuracy: ±0.3°C
  - Nominal response: 30% to 90%

Hygrometry measures or monitors buildings for adequate ventilation affecting indoor air quality and moisture problems.

## Airborne Mould Sampling

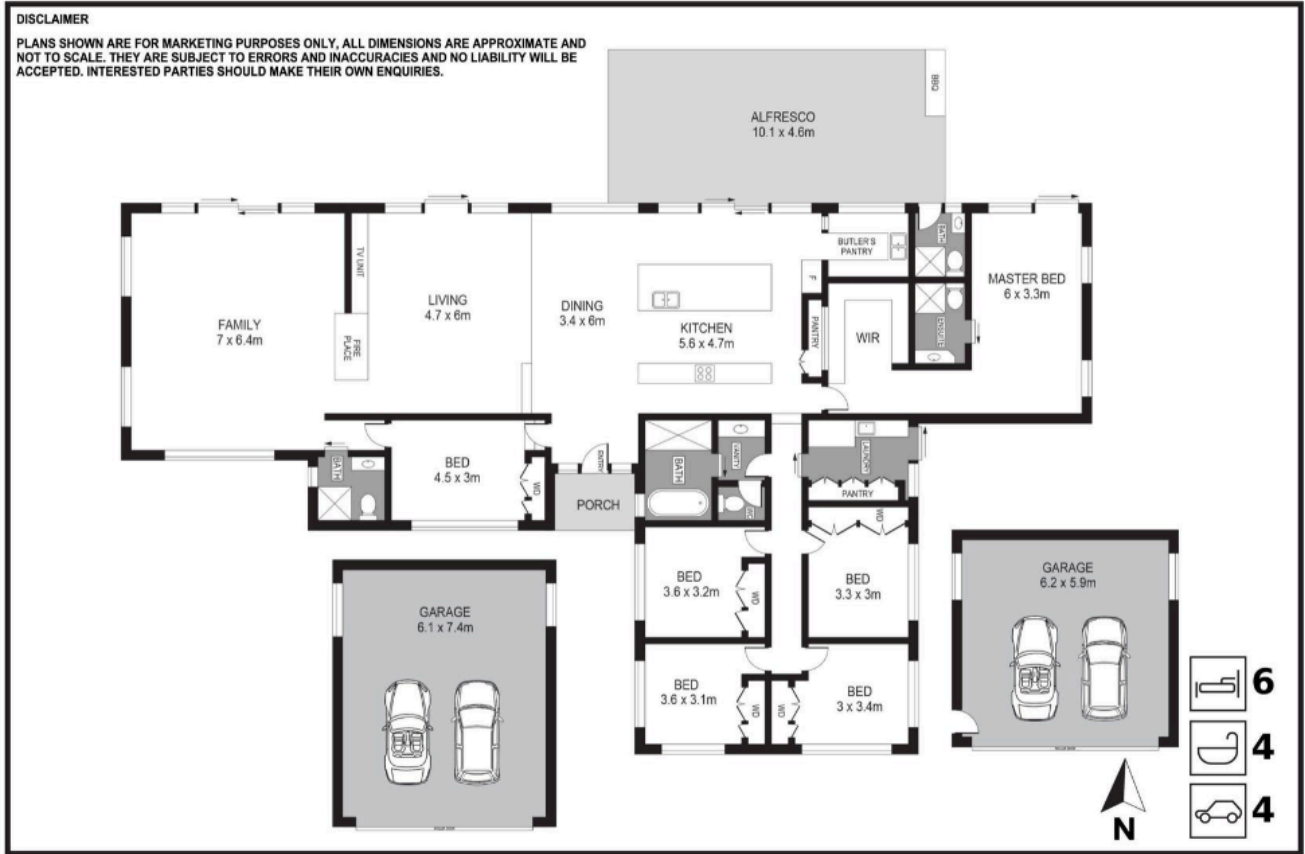
If sampling is required, NoToxRox uses Air-O-Cell cassettes with a Zefon Bio-pump air sampler to collect viable and/or non-viable airborne mould samples. Air samples are collected over a five-minute period at a flow rate of 15 litres per minute. Results from the Air-O-Cell samples are reported in spores per cubic metre of air (spores/m<sup>3</sup>).

The samples are analysed by EUROFINs AEML Lab, a NATA-accredited laboratory specializing in microbial analysis. An external control sample is collected to provide outdoor comparison data, and a field blank is submitted to ensure the validity of the results.







## Surface Mould Sampling

If surface sampling is required, NoToxRox uses BioTape tape lift sampling and/or swabs to assess mould contamination on surfaces. The results are presented as a percent composition of the sample. This is a breakdown of the percentage of the total spore count of the sample that each spore comprises. Results are reported in spores per square centimetre (spores/cm<sup>2</sup>)

# 9 WILDTHORN AVENUE, DURAL



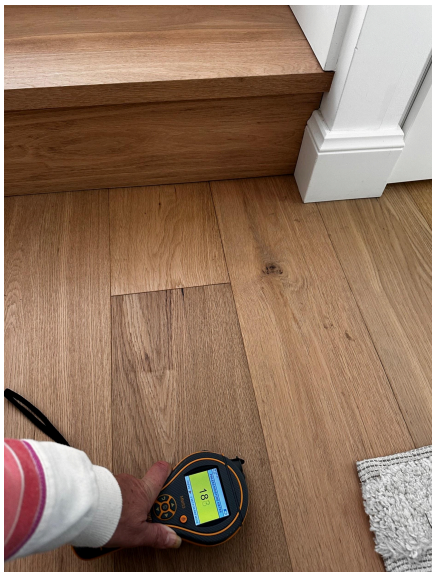
**OBSERVATIONS AND RESULTS**

<p><b>MESSAGE ROOM</b></p>		
		
<p>Elevated moisture readings were recorded beneath the timber floorboards adjacent to the external wall. This wall is located below ground level, increasing the likelihood of moisture ingress or lateral damp transfer.</p>	<p>Elevated moisture was detected along the base of the wall, extending horizontally along the wall line. Under the window, increased readings were noted from floor level up to approximately 1 metre in height</p>	<p>Overview of the massage room showing its below-ground position and proximity to the external wall where elevated moisture levels were identified.</p>
<p><b>MESSAGE ROOM</b></p>		
		
<p>Moisture readings to the wall surface adjacent to the window were within normal limits, with no elevated moisture detected at the time of inspection.</p>	<p>Moisture readings to the timber flooring in the adjacent area were within acceptable ranges, indicating no widespread moisture impact beyond the previously identified wall zone and adjacent floorboards.</p>	<p>Elevated moisture was detected in the area marked in red.</p>

**MESSAGE ROOM**







**MESSAGE ROOM**

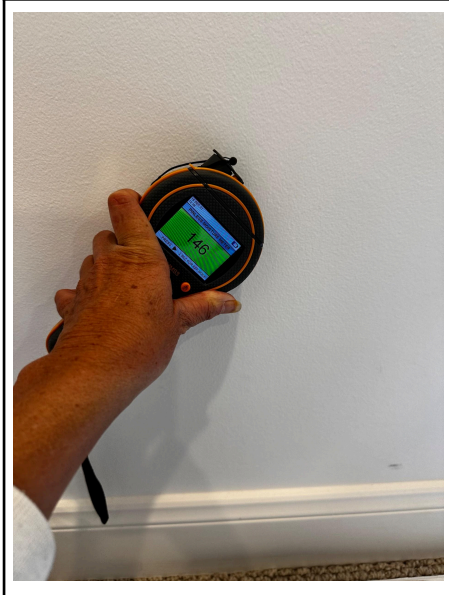

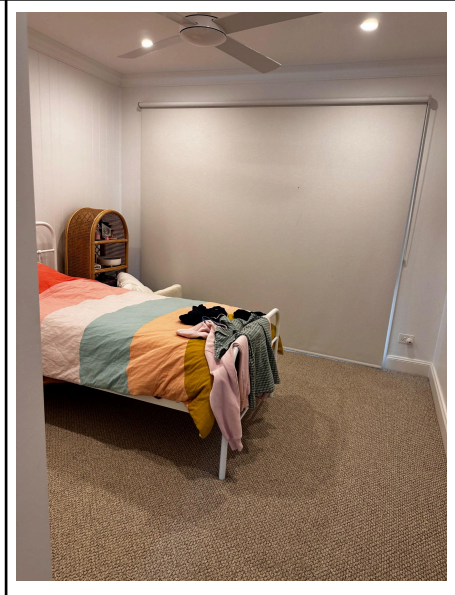


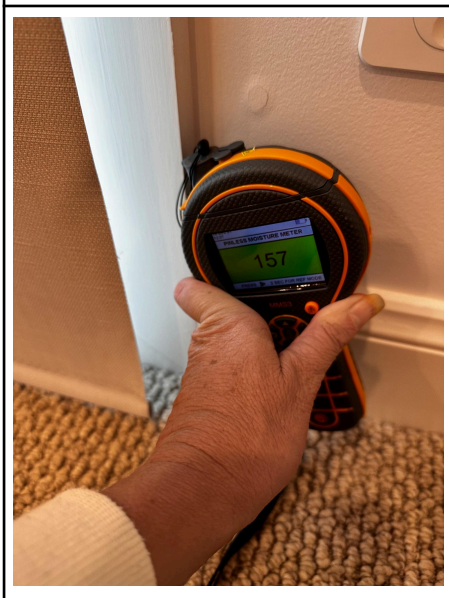
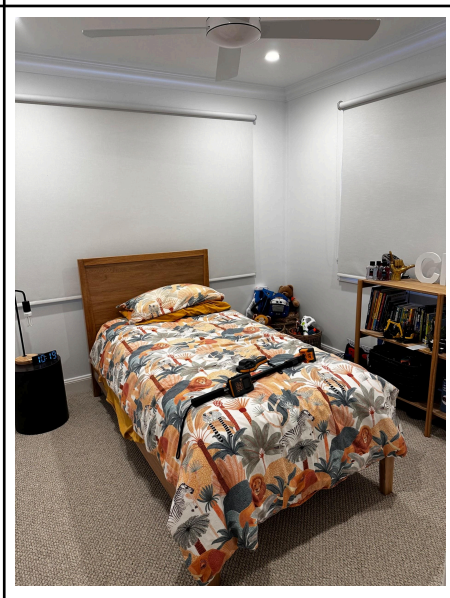
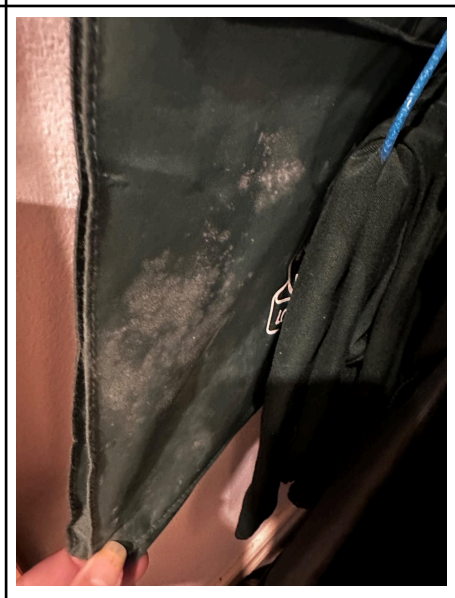
Normal moisture readings were detect towards the centre of the room

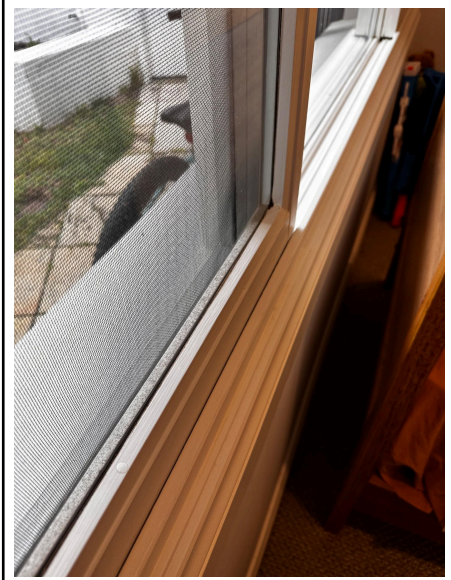
An air sample was taken from this room


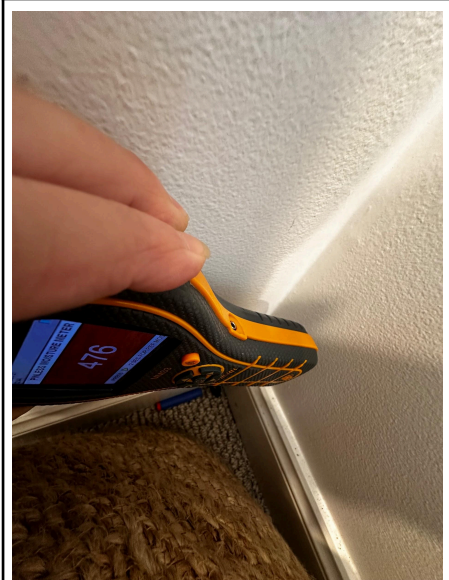
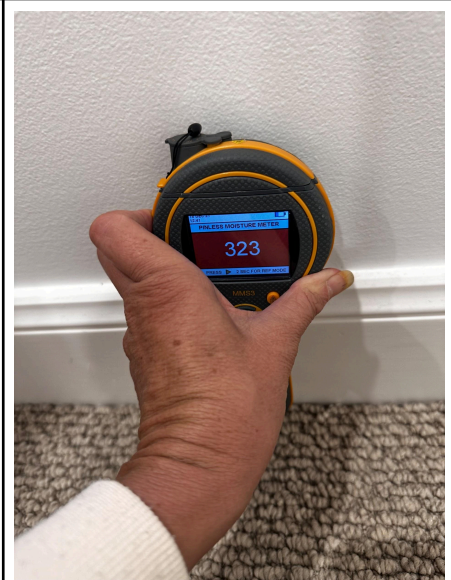
MASSAGE ROOM		
		
<p>Visible mould was seen growing on the rattan baskets in Massage room</p>	<p>Thermal imaging of the external wall shows a cooler area to the lower section of the wall and corner junction,</p>	<p>consistent with moisture presence or reduced thermal performance in this below-ground wall section.</p>

ENTRANCE		OFFICE
		
	<p>Elevated moisture was also detected around the entrance at the front door. There was a slight musty odour here</p>	

OFFICE		BEDROOM
		
<p>Normal moisture readings were detected throughout the office upper walls, floor and ceiling.</p>	<p>Elevated moisture was detected along the base of the external wall in the office. This area backs on to the pond outside.</p>	




BEDROOM	BEDROOM	
		
<p>Normal moisture readings were detected throughout this bedroom</p>		<p>Mould was found on some items of clothing in the cupboard in this bedroom</p>




		
<p>Slightly elevated humidity readings were detected throughout the house. This is often consistent with building materials holding elevated moisture</p>		<p>Normal moisture readings were detected throughout the ceiling</p>

		<p><b>BEDROOM</b></p> 
		<p>No elevated moisture was detected in this bedroom</p>
<p>However elevated moisture levels were detected at the base of the walls in this bedroom indicating rising damp.</p>		

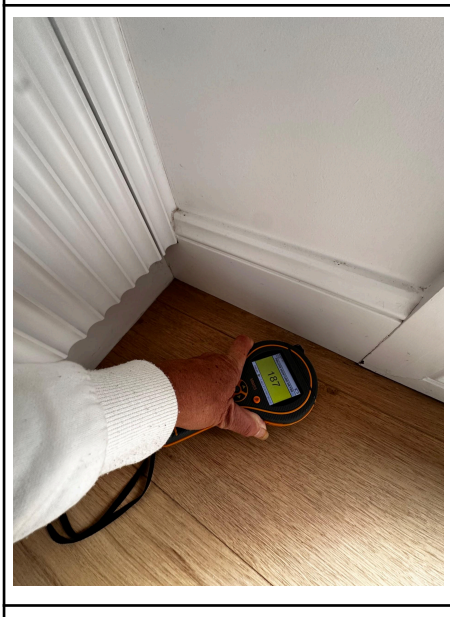
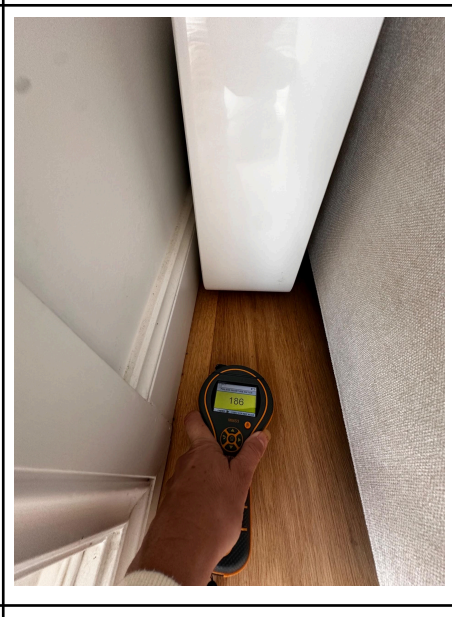

<b>BEDROOM</b>		
		
<p><b>Normal moisture readings throughout this room</b></p>		

	<b>MASTER BEDROOM</b>	
		
		<p><b>No elevated moisture was detected beneath the carpet at the junction with the ensuite. The subfloor and smooth edge look to be in good condition.</b></p>

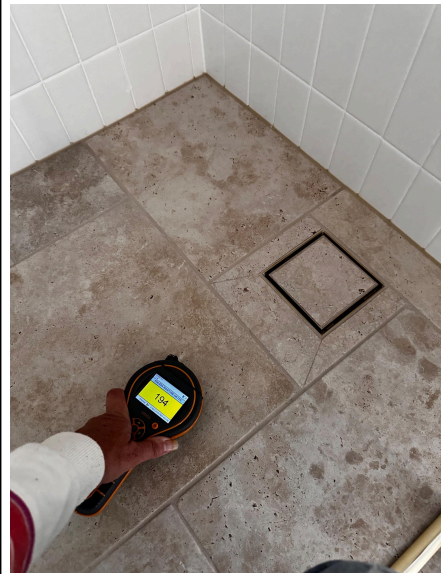
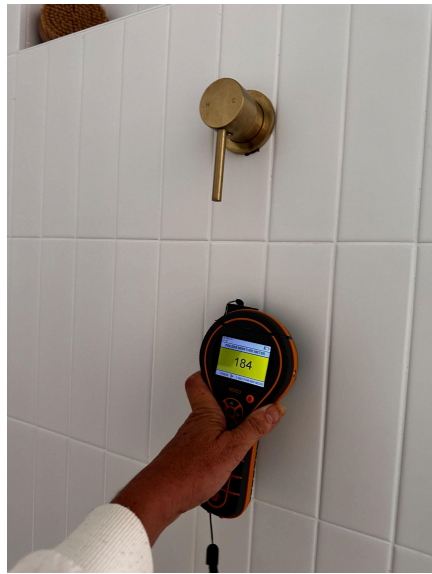
MASTER BEDROOM		
		
Normal moisture ratings beneath the carpet.	Suspected mould growth on the underside of the bedroom slats in the master bedroom. This is usually due to chronic high humidity	Normal moisture readings at the base of the external wall. No sign of rising damp in this room.

ENSUITE	LIVING ROOM	
		
There were no signs of elevated moisture throughout any of the bathrooms		

<b>LIVING</b>		
		
<p>This section on the stairs between the living and dining area revealed elevated moisture</p>		

<b>LIVING</b>		<b>FAMILY (AERIAL ROOM)</b>
		
<p>Normal moisture readings were detected throughout the rest of the living room</p>		<p>No elevated moisture was detected throughout the aerial room.</p>

**BATHROOM**



All the wet rooms had normal moisture readings.

**OUTSIDE**






External view of the massage room wall showing the adjacent pond and paved area. The external ground level is higher than the internal floor level of the room, placing this wall below ground and increasing the risk of lateral moisture ingress.

Detail of the external wall and window base. The paving is installed directly against the wall with limited visible clearance, which may restrict drainage and contribute to moisture accumulation against the building envelope.

Subfloor/drainage view beneath the external paving adjacent to the massage room. While drainage infrastructure is present, the area remains below ground level and shows signs of debris and moisture exposure, which may limit effective water movement away from the wall and contribute to ongoing damp conditions internally.

<p><b>OUTSIDE</b></p>		
		
<p>External pond located directly adjacent to the massage room. The large, retained body of water in close proximity to the building increases local ground moisture levels and hydrostatic pressure against below-ground wall.</p>	<p>Closer view of the pond edge and planting area directly abutting the external wall of the massage room. Water levels are in close contact with the retaining structure, contributing to a persistently damp environment along this wall.</p>	<p>High moisture reading recorded to the external wall surface (607 REL)</p>

<p><b>OUTSIDE</b></p>	<p>Outdoor Temp 19.1°C RH 49.2%</p>	
		
<p>External view of the opposite elevation of the dwelling. This side of the building is above ground level with adequate clearance and drainage.</p>	<p>These conditions are within normal ranges. Compared to, indoor readings which were notably higher, indicating that moisture is being retained within the building materials.</p>	<p>Garden bed located adjacent to the external wall. Vegetation and soil are positioned directly against the building envelope, which can contribute to increased moisture load and reduced drying potential along the wall.</p>

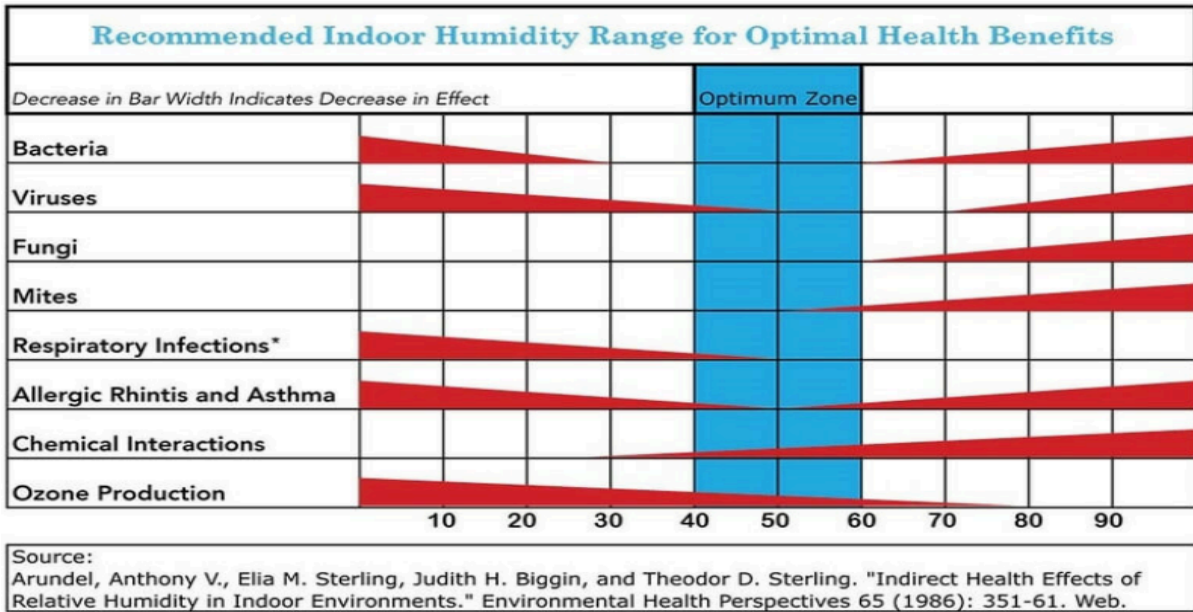
OUTSIDE		
		
<p>Garden bed and paving in close proximity to the building. Ground levels remain relatively high against the wall, limiting drying potential and contributing to increased moisture load.</p>	<p>Elevated moisture reading (439 REL) recorded to the lower section of the external wall, indicating moisture retention within the wall assembly consistent with lateral damp ingress.</p>	<p>Detail of the external wall junction and paving interface. Limited clearance and drainage at the base of the wall may allow moisture to accumulate against the building, contributing to ongoing damp conditions internally.</p>

## TEMPERATURE AND HUMIDITY SUMMARY

Relative humidity (RH) is a measure of how much moisture is in the air compared to the maximum amount the air can hold at a given temperature. When RH exceeds 60%, conditions become more favourable for mould growth, especially on cool surfaces where condensation may occur.

Indoor measurements recorded a relative humidity of 63.5% at 21.8°C, with a specific humidity of 10.33 g/kg. In contrast, external conditions at the time of inspection were significantly lower, with a relative humidity of 49.2% at 19.1°C and a specific humidity of 6.76 g/kg. This indicates that the indoor environment is holding substantially more moisture than the outdoor air, both in relative and absolute terms.

This difference suggests that the elevated indoor humidity is not being driven by external atmospheric conditions alone, but is likely influenced by moisture retained within the building materials and structure. In situations such as this, moisture can accumulate within walls, flooring, or below-ground elements and gradually release into the indoor air, increasing the overall moisture load. Relative humidity levels above 60% create conditions that are more favourable for mould growth, particularly on cooler surfaces where condensation may occur.



**SAMPLING RESULTS**

**\*See attached laboratory results for a full analysis.**

On this occasion, 4 indoor air samples and a control sample from outside were taken. Air and Surface Samples get sent to AEML Laboratory in Melbourne (a NATA certified Lab) for analysis. The Air-O-Cell method is non-culturable and reports total spore counts of both viable and non-viable mould spores. They also tell us the presence of fungal hyphae which is active mould growth.

Air sampling has certain limitations as it represents only a specific moment in time. Multiple samples are required for an accurate assessment, which can be costly. Some moulds sporulate at specific times of the day, which could result in them being missed. Additionally, outdoor samples can be influenced by weather and environmental conditions, potentially affecting the results.

Attention: Joanne Lia  
Report: 1341343-ML  
Project name: 9 WILDTHORN AVE DURAL NSW  
Project ID: DURAL  
Received Date: Mar 31, 2026

Client Sample ID	OUTSIDE			LOWER MESSAGE ROOM			OFFICE			ENTRANCE		
Sample Matrix	Spore Trap			Spore Trap			Spore Trap			Spore Trap		
Eurofins Sample No.	26-Ma0093491			26-Ma0093492			26-Ma0093493			26-Ma0093494		
Date Sampled	Mar 27, 2026			Mar 27, 2026			Mar 27, 2026			Mar 27, 2026		
<b>Spore Trap Mould Analysis</b>												
% Analysed	100			100			100			100		
Flow Rate (L/min)	15			15			15			15		
Sampling time (min)	5			5			5			5		
LOR	13			13			13			13		
Background Debris	2			3			3			3		
	Raw Counts	fs/m <sup>3</sup>	%	Raw Counts	fs/m <sup>3</sup>	%	Raw Counts	fs/m <sup>3</sup>	%	Raw Counts	fs/m <sup>3</sup>	%
Hyphal Fragments	8	110		6	80		5	67		2	27	
Un-ID	-	-	-	-	-	-	-	-	-	-	-	-
<b>Identification</b>												
Pollen	2	27		4	53		1	13		-	-	
Alternaria	1	13	1	2	27	<1	-	-	-	1	13	1
Arthrinium	-	-	-	-	-	-	-	-	-	-	-	-
Ascospores (UD)	18	240	17	5	67	<1	13	170	<1	7	93	6
Aspergillus/Penicillium-like	3	40	3	M21 2100	28000	99	M21 2800	37000	98	93	1200	73
Basidiospores (UD)	52	690	50	9	120	<1	15	200	1	15	200	12
Drechslera/Bipolaris-like	-	-	-	-	-	-	-	-	-	-	-	-
Botrytis	-	-	-	-	-	-	1	13	<1	-	-	-
Chaetomium	-	-	-	1	13	<1	-	-	-	-	-	-
Cladosporium	5	67	5	2	27	<1	4	53	<1	4	53	3
Curvularia	1	13	1	1	13	<1	-	-	-	-	-	-
Epicoccum	1	13	1	2	27	<1	-	-	-	-	-	-
Ganoderma	1	13	1	-	-	-	-	-	-	1	13	1
Nigrospora	-	-	-	-	-	-	1	13	<1	-	-	-
Pithomyces	1	13	1	3	40	<1	1	13	<1	-	-	-
Smuts/Myxomycetes/Periconia	19	250	18	5	67	<1	10	130	<1	4	53	3
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-	-	-	-
Torula	2	27	2	-	-	-	-	-	-	2	27	2
<b>Total (fs/m<sup>3</sup>)</b>	<b>104</b>	<b>1400</b>		<b>2130</b>	<b>28000</b>		<b>2845</b>	<b>38000</b>		<b>127</b>	<b>1700</b>	

#### AIRBORNE MOULD REFERENCE LEVELS

<i>Australian Mould Guidelines (2010) for Airborne Total Spores (viable &amp; non-viable)</i>	
RANGE	TOTAL INDOOR CONCENTRATION IN A NATURALLY VENTILATED BUILDING
Low	< 1/2 outdoor air
Normal	< outdoor air
Elevated	> 1000 spores/m <sup>3</sup>
High	> 2500 spores/m <sup>3</sup>
Extremely High	> 5000 spores /m <sup>3</sup>

Client Sample ID	LIVING - AERIAL		
Sample Matrix	Spore Trap		
Eurofins Sample No.	26-Ma0093495		
Date Sampled	Mar 27, 2026		
<b>Spore Trap Mould Analysis</b>			
% Analysed	100		
Flow Rate (L/min)	15		
Sampling time (min)	5		
LOR	13		
Background Debris	3		
	Raw Counts	fs/m <sup>3</sup>	%
Hyphal Fragments	3	40	
Un-ID	-	-	-
<b>Identification</b>			
<i>Alternaria</i>	1	13	2
<i>Arthrinium</i>	-	-	-
Ascospores (UD)	2	27	4
<i>Aspergillus/Penicillium</i> -like	15	200	33
Basidiospores (UD)	8	110	17
<i>Drechslera/Bipolaris</i> -like	-	-	-
<i>Chaetomium</i>	-	-	-
<i>Cladosporium</i>	12	160	26
<i>Curvularia</i>	-	-	-
<i>Epicoccum</i>	1	13	2
<i>Nigrospora</i>	-	-	-
<i>Pithomyces</i>	1	13	2
Smuts/Myxomycetes/Periconia	6	80	13
<i>Stachybotrys/Memnoniella</i>	-	-	-
<b>Total (fs/m<sup>3</sup>)</b>	<b>46</b>	<b>620</b>	

Condition	Definition
Condition 1	<b>Normal Fungal Ecology:</b> An indoor environment with settled spores, fungal fragments, or traces of actual growth, reflecting a normal fungal ecology.
Condition 2	<b>Settled Spores:</b> An indoor environment contaminated primarily with settled spores or fungal fragments dispersed from a Condition 3 area. May have traces of actual growth.
Condition 3	<b>Actual Growth:</b> An indoor environment contaminated with actual mold growth, associated spores, and fungal fragments. Visible or hidden growth.

\*ANSI/IICRC S520 Standard for Professional Mold Remediation, 2021

## DISCUSSION

When assessing indoor air quality, we expect to see the same genera of mould indoors as outdoors, but in lower concentrations and similar rank order. Where indoor levels significantly exceed outdoor levels, or where water damage indicator species are present, this suggests an indoor source of amplification.

The outdoor control sample recorded a total spore count of 1,400 spores/m<sup>3</sup>, which is within a normal environmental range. In contrast, the indoor samples taken from the lower massage room (28,000 spores/m<sup>3</sup>) and office (38,000 spores/m<sup>3</sup>) were extremely high and dominated by *Aspergillus*/*Penicillium* species. These levels are significantly above what would be expected in a healthy indoor environment and indicate substantial indoor mould amplification. The entrance sample was also elevated, with *Aspergillus*/*Penicillium* at 1,200 spores/m<sup>3</sup> and a total spore count of 1,700 spores/m<sup>3</sup>, further supporting the presence of a broader indoor issue affecting this section of the home.

In contrast, the sample taken from the living room (referred to as the aerial room on the laboratory report and floor plan, but identified as the family room within the dwelling) recorded a total spore count of 620 spores/m<sup>3</sup>. This is considered within normal limits and is consistent with a typical indoor environment. Importantly, this sample did not contain water damage indicator species and reflects a Condition 1 (normal fungal ecology) environment. This area was used as a reference sample and supports the conclusion that the mould issue is localised to specific sections of the home rather than being uniform throughout.

The lower massage room and office, along with the entrance area, are all located along adjacent to the external pond and below-ground wall sections. Moisture mapping and thermal imaging confirmed elevated moisture levels within these walls and floor junctions. The building configuration, including below-ground construction, high external ground levels, garden beds, and the presence of a large body of water immediately adjacent to the structure, is creating sustained moisture loading against the building envelope. This is consistent with the elevated indoor humidity readings and supports the conclusion that the building materials are retaining moisture and contributing to ongoing mould growth.

*Chaetomium* was detected within the lower massage room sample. This genus is widely recognised as a water damage indicator and is typically associated with prolonged moisture exposure and cellulose-based materials. Its presence confirms that the area has been subject to chronic damp conditions. *Torula* was detected in the entrance sample and also in the outdoor control. *Torula* is not considered a primary water damage indicator but is commonly associated with damp environments and decaying organic matter. Its presence indoors, particularly in combination with elevated *Aspergillus*/*Penicillium* levels, still supports the presence of moisture-related conditions.

Fungal hyphal fragments were identified across all indoor samples. Hyphal fragments are indicative of recent or active mould growth rather than historic or settled contamination. While the levels detected (ranging from approximately 27–80 fragments/m<sup>3</sup>) are not extremely high in isolation, their presence alongside significantly elevated spore counts strengthens the conclusion that active mould growth is occurring within the affected areas.

A musty odour was noted at the entrance and externally near the pond area, which was not fully reflected in the spore trap results. This suggests the likely presence of microbial volatile organic compounds (mVOCs), which are gases released during active microbial growth. mVOCs are not captured in spore trap sampling and can often be detected by odour even when airborne spore counts are only moderately elevated. This supports the conclusion that microbial activity is occurring within building materials or concealed areas.

Elevated moisture readings were also recorded at the transition between the living and dining areas, particularly at the sunken step. While this area was not sampled, the presence of elevated moisture and its proximity to the affected elevation raises concern for potential hidden mould growth, particularly behind furnishings such as the couch. Further investigation of this area would be warranted.

Based on the findings, the lower massage room and office are considered to be Condition 3 environments under the ANSI/IICRC S520 standard, indicating active mould growth. The entrance area is likely a Condition 2

environment, reflecting contamination from adjacent Condition 3 areas. The remainder of the home, including the family room (aerial room), appears to be Condition 1.

Overall, the results are consistent with a building affected by ongoing moisture intrusion from external sources, particularly along the pond-facing elevation. The elevated mould levels are not random but directly correlate with areas where moisture has been identified within the building structure. Addressing the mould alone will not be sufficient. The underlying moisture sources, including external ground levels, drainage, and the proximity of the pond, will need to be addressed to prevent recurrence.

## RECOMMENDATIONS

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Based on the findings of this assessment, it is important to understand that the elevated mould levels identified in the lower massage room, office, and entrance are directly linked to ongoing moisture ingress from the external environment. These areas are located along a below-ground elevation of the building, with high external ground levels, garden beds, and a large pond positioned immediately adjacent to the structure. As such, the issue is not superficial and will not be resolved through cleaning alone.

To make these rooms suitable for regular use, significant works would be required to address the underlying moisture sources. This would likely involve improvements to external drainage, potential excavation to reduce ground levels against the building, and reconfiguration of the pond or surrounding landscape to reduce hydrostatic pressure against the wall. Additional building works may also be required to improve waterproofing and drying potential of the affected wall assemblies.

It is acknowledged that, as a tradesperson with plumbing experience, you will have a good understanding of how water behaves around structures and the importance of proper drainage. This will be beneficial in assessing the feasibility of these works. However, it is important to recognise that resolving these issues may involve a combination of landscaping, drainage, and building remediation, and is unlikely to be a minor undertaking.

The remainder of the home, particularly areas located away from the pond-facing elevation, appears to be performing within normal limits based on the available data. The issues identified are localised but significant. If proceeding with the purchase, consideration should be given to the scope of work required to rectify these areas and whether this aligns with your expectations, budget, and long-term plans for the property.

**THANK YOU FOR USING NOTOXROX BUILDING BIOLOGY SERVICES.**

## CREDENTIALS

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This report was prepared by Joanne Lia. I am the director of NoToxRox Building Biology Services. I am a certified Building Biologist and have completed my training with the Australian College of Environmental Studies (ACES). I have advanced training in: Mould Technician course (BLDBIO606) and the Mould Testing and Destructive Sampling (RTO21740) training through ACES. In addition, I have completed the Water Damage Restoration certification and the Applied Microbial Remediation Technician Certification through the Institute of Inspection Cleaning and Restoration (IICRC) and Post Remediation Verification Training. I have completed a nationally accredited course in Electromagnetic Field Testing (BLDBIO602). My job is to evaluate health hazards in the built environment and provide strategies to address exposure and/or source control.

## DISCLAIMER

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This disclaimer sets out the scope of the Services and the liability of Joanne Lia (ABN 18 661865939) **Building Biologist** (including its directors, employees, agents and contractors) when performing the Services. By undertaking the Services, the client agrees to this disclaimer:

- (a) Using best practices and the Building Biologists own experience, the Building Biologist will endeavour to identify and investigate any potential environmental risks in the client's premises including, but not limited to assessing the premises for allergens, toxicants, electromagnetic fields and biotoxins, mobile phone towers, moulds and bacteria, impurities in the water supply or other similar chemicals and toxins which may affect the client, the inhabitants of the premises or visitors to the premises. However, the Building Biologist does not guarantee that they will identify every potential hazard, and that every potential environmental health hazard identified will be the source of the client's symptoms. The Building Biologist will recommend solutions to the client; however, the Building Biologist does not guarantee that these solutions will solve or fix the client's symptoms. The client acknowledges and agrees that they rely on the Building Biologist's solutions and recommendations at their own risk.
- (b) The Building Biologist may recommend products from third party suppliers. The client acknowledges and agrees that the Building Biologist is not responsible for these products and has no control over or rights in them. The Building Biologist does not guarantee that these products will solve or fix any identified health hazards or the client's symptoms.
- (c) As part of the Building Biologist's Services, the Building Biologist may conduct sampling or testing of the premises. The client acknowledges that the results of these Tests represent the conditions and potential environmental risks of the premises at the time the Tests are conducted. The client acknowledges and agrees that the Tests may not diagnose and reflect the potential environmental risks of the premises that arise in the future or potential environmental risks which were not present on the day the Tests were conducted.
- (d) The Building Biologist may require the consent of the client to inspect or sample building cavities by removing plaster, timber or other materials to access the cavity. Where the client withholds consent, the client acknowledges and agrees that the Services and any recommendations and solutions provided by the Building Biologist may not be an accurate reflection of the potential environmental risks in the premises. While the Building Biologist will endeavour to not damage the premises, the Building Biologist makes no promise or guarantee and is not responsible for loss or damage to the premises arising out of or relating to the Building Biologist's access to the site and/or performance of the Services.
- (e) The client acknowledges and agrees that any recommendations or solutions provided by the Building Biologist in relation to the premises must be approved by a licensed builder, designer, architect or other licensed or registered professional. The Building Biologist in no way warrants that its recommendations comply with the standards under the National Construction Code, the Building Code of Australia or any other relevant building or construction code or regulation.
- (f) This report does not constitute a structural or engineering assessment, nor does it provide certification regarding asbestos content or compliance with building code. All building material identifications and assumptions are based on visual cues, professional experience, and supporting documentation where available. It is the responsibility of the client or property manager to engage licensed professionals to confirm structural integrity, asbestos presence, or other regulated matters where necessary.
- (g) The client acknowledges and agrees that the Building Biologist's role is not to provide health care or health or medical services; or to diagnose, treat or cure any disease, condition or other physical or mental ailment of the human body. The client acknowledges that the Building Biologist is not acting in the capacity of a doctor, psychologist or other licensed or registered professional, and that any advice that is given by the Building Biologist is not meant to take the place of advice by these professionals. Before relying on the Building Biologists recommendations, you should seek medical advice to evaluate any risks associated with their recommendations. By not seeking such advice, you accept the risk that the Building Biologist's recommendations may not be right for you.

**This report should be read in full. No responsibility is accepted for excerpts taken out of context.**

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**Understanding Mould Remediation**

The goal of mould remediation is removal, not just killing the mould. Even non-viable mould spores can release mycotoxins when disturbed, which can contribute to health issues. According to IICRC S520: Standard for Professional Mould Remediation, the key principles of mould removal include:

- ✔ **Identifying and stopping the moisture source**
- ✔ **Containing and removing affected materials safely**
- ✔ **Proper cleaning and drying to prevent regrowth**

**When to Call a Professional:**

- If the affected area is **greater than 1m<sup>2</sup>**, consult a professional mould remediator following **IICRC S520** guidelines.
- If health symptoms worsen after exposure.
- If mould is found inside HVAC systems or porous structural materials.

**1. Cleaning Mould from Different Surfaces**

Surface Type	Recommended Cleaning Method	Notes
<b>Non-Porous Surfaces</b> ( <i>glass, metal, ceramic tiles, hard plastics, varnished wood</i> )	✔ HEPA vacuum first ✔ Wipe with detergent and water ✔ Follow with a diluted vinegar solution or natural antifungal (e.g., Thieves cleaner)	⊘ <b>Avoid bleach!</b> It does not remove spores and can worsen mould growth.
<b>Semi-Porous Surfaces</b> ( <i>sealed wood, painted walls, laminate</i> )	✔ HEPA vacuum ✔ Wipe with detergent and water ✔ Monitor for recurring mould growth	⚠ If swelling or softening occurs, replacement may be necessary.
<b>Porous Surfaces</b> ( <i>gyprock, MDF, wallpaper, carpet, ceiling tiles</i> )	✘ <b>Difficult to fully remediate</b> – replacement is often required	If valuable, consider <b>specialist treatment</b> (e.g., ozone chamber, freeze-drying).
<b>Soft Furnishings &amp; Clothing</b> ( <i>bedding, cushions, toys, upholstery</i> )	✔ Wash in <b>hot water</b> with <b>½ cup borax</b> ✔ Add <b>1 cup vinegar</b> in rinse cycle ✔ Sun-dry or tumble-dry	⊘ Discard if visible mould remains or if musty smell persists.
<b>Electronics &amp; Appliances</b> ( <i>computers, TVs, air purifiers, kitchen appliances</i> )	✔ HEPA vacuum ✔ Use <b>compressed air</b> to remove internal dust ✔ Wipe with <b>isopropyl alcohol or vinegar</b>	If mould is inside, <b>professional cleaning may be needed.</b>

## 2. How to Clean Mould from Non-Porous Surfaces

If the mould contamination is less than 1m<sup>2</sup>, follow this step-by-step process:

### Step 1: Protect Yourself

- Wear P2/N95 mask, goggles, gloves, + disposable coveralls (or clothes that can be discarded).

### Step 2: Stop the Moisture Source

- Identify and fix leaks, condensation, or high humidity to prevent regrowth.

### Step 3: HEPA Vacuum the Surface

- Use a vacuum with a HEPA filter to remove loose spores before wiping.

### Step 4: Clean with Detergent and Water

- Use dishwashing liquid + water and wipe with a microfiber cloth in one direction (not circular).
- Dispose of the cloth after use.

### Step 5: Apply Natural Antifungal

- Wipe the area again with diluted vinegar or Thieves cleaner.  
⊘ **Do NOT use bleach**—it only bleaches mould, allowing it to return.

### Step 6: Keep the Area Dry

- Regularly clean with non-toxic cleaners to prevent future mould growth.
- 

## 3. What to Do with Mould-Contaminated Porous Items

Porous materials absorb moisture and mould spores, making them harder to clean.

### Clothing, Soft Toys, and Fabrics

- ✓ Wash in HOT water with ½ cup borax
- ✓ Add 1 cup vinegar in the rinse cycle
- ✓ Dry in the sun or tumble dry
- ✓ Repeat if necessary—if mould remains visible or musty, discard it

⊘ Avoid dry cleaning—it is not effective at removing mould.

### Mattresses, Couches, and Upholstery

- ✓ HEPA vacuum thoroughly
- ✓ If salvageable, hot water extraction or immersion cleaning is recommended.
- ✓ Severe contamination = discard.

### Paper & Documents

- If valuable, copy or digitize before discarding.
- Freeze-drying or ozone chamber treatment may be an option for historic documents.

#### 4. Cleaning Mould from Electronics & Appliances

**Precaution:** Ensure electronics are unplugged before cleaning.

- ✓ HEPA vacuum all surfaces
- ✓ Use compressed air to remove mould inside vents and fans
- ✓ Wipe with isopropyl alcohol or vinegar
- ⊘ If mould is inside circuits, replacement or professional cleaning is required.

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#### 5. Preventing Future Mould Growth

To keep mould from returning, follow these preventative measures:

- ✓ **Control Humidity:** Keep indoor humidity below **60%** (ideally **40-50%**).
- ✓ **Improve Ventilation:** Use exhaust fans, dehumidifiers, and open windows when possible.
- ✓ **Fix Leaks Promptly:** Any water damage must be dried within 24-48 hours to prevent mould.
- ✓ **Use HEPA Air Purifiers:** This can help reduce airborne spores in high-risk areas.
- ✓ **Regularly Clean with Non-Toxic Products:** Avoid harsh chemicals like bleach that can worsen mould problems.

#### When to Seek Professional Remediation

If you experience recurrent mould issues, health symptoms, or extensive contamination, seek a professional who follows IICRC S520 mould remediation standards.

#### Summary: When to Clean vs. When to Replace

Item	Clean & Keep?	Replace?
Hard surfaces (glass, metal, tiles)	✓ Yes, can be cleaned	✗ No need to replace
Small area of mould on walls (<1m <sup>2</sup> )	✓ Yes, clean with detergent & vinegar	✗ No, unless severe damage
Large mouldy areas on walls (>1m <sup>2</sup> )	✗ No. Professional remediation needed	✓ Yes. Replace damaged sections
Carpets with mould	✗ No. Difficult to clean	✓ Yes. Replace if visibly mouldy
Mattresses & couches	✓ Maybe, if contamination is minor	✗ Likely, if deeply mouldy
Clothing & soft toys	✓ Yes, wash with borax & vinegar	✗ Discard if smell/mould persists

Condensation forms when warm, moisture-laden indoor air comes into contact with cooler surfaces. Windows, metal fixtures, and external walls are often the coldest parts of a home, which is why moisture tends to form on these surfaces first.

This is more noticeable in winter. Indoor heating increases the temperature difference between inside and outside, which increases the likelihood of condensation forming. Modern homes are often more sealed to improve energy efficiency, but without adequate ventilation, this can trap moisture indoors.

Single glazed windows and aluminium window frames lose heat quickly and are more likely to become cold enough for condensation to form. Heavy curtains and blinds can make this worse by preventing warm air from reaching the glass surface.

If moisture is allowed to sit on surfaces regularly, it creates conditions suitable for mould growth. Managing airflow, reducing indoor humidity, and using mechanical support such as dehumidifiers or ventilation systems are key to preventing this.

### MANAGING INDOOR HUMIDITY.

Maintaining appropriate indoor humidity is essential for preventing mould growth and reducing dust mite activity. In coastal areas such as Sydney, outdoor humidity is often high, which means passive ventilation alone is not always sufficient.

Indoor relative humidity should ideally be maintained below 60%, and preferably between 50–55% where possible.

#### Ventilation and Airflow

- Open windows daily where conditions allow to promote air exchange.
- On humid or rainy days, limit window opening and rely more on mechanical drying.
- Ensure adequate airflow throughout the home, particularly in bedrooms and enclosed spaces.
- Avoid blocking airflow around beds, walls, and furniture.
- Do not store items under beds where possible, as this restricts air movement.
- Regularly leave cupboards open to encourage airflow.

#### Condensation Management

- Condensation commonly forms on colder surfaces such as windows and metal fixtures.
- This is more noticeable in winter when indoor heating increases the temperature difference between inside and outside.
- Keep air moving across windows and external walls to reduce condensation risk.
- Avoid heavy curtains or blinds that trap cold air against windows.
- Where possible, consider improving window performance, noting this is a longer-term measure.

#### Moisture Control Practices

- Always use bathroom exhaust fans during and after showering for at least 15 minutes.
- Avoid leaving wet towels in bathrooms unless they can dry quickly.
- Do not dry clothes indoors, as this introduces significant moisture into the air.
- Avoid the use of unflued gas heaters, which release both moisture and combustion by-products.

## Dehumidification and Mechanical Support

- In persistently humid environments, a portable dehumidifier is often required.
- Dehumidifiers should be used regularly to maintain indoor humidity within an acceptable range.
- Smaller enclosed areas such as cupboards may benefit from passive moisture absorbers.

## Cleaning and Maintenance

- Regularly clean and maintain HVAC systems to ensure effective operation.
- Vacuum soft furnishings such as mattresses, pillows, couches, and curtains using a HEPA-filter vacuum.
- Replace pillows regularly and mattresses approximately every 8–10 years.
- Reduce clutter to minimise dust accumulation and improve airflow.
- Remove shoes at entry points to reduce contaminants brought indoors.

## Building Maintenance

- Regularly check gutters and downpipes to ensure they are clear and functioning correctly.
- Ensure external drainage directs water away from the building.
- Address any signs of dampness or water ingress promptly.

## RECOMMENDED PRODUCTS

### Recommended Dehumidifiers

For homes with persistently high humidity, a good quality dehumidifier can make a significant difference. The following range has performed well in humid coastal environments:

#### Ausclimate Dehumidifiers

<https://www.ausclimate.com.au/products/dehumidifiers>

[Ausclimate\\_DehumidifierComparisonChart\\_-2021\\_6-.pdf \(ctfassets.net\)](#)

Use promo code: **NOTOXROX**

### Recommended Air Purifiers

Where indoor air quality is a concern, a high-quality HEPA air purifier can help reduce airborne particulates, including dust and mould spores. Inova are industry leaders with HEPA filtration and High Carbon filters. Inova offers free shipping to my clients. Contact me for ordering information.

#### Inova Air Purifiers

<https://inovaairpurifiers.com.au/>

Contact 1300 833 689

### Winix

<https://www.ausclimate.com.au/products/air-purifiers/range>

Use promo code: **NOTOXROX**

### Cupboard / Wardrobe Moisture Control

For smaller enclosed storage areas, passive moisture absorbers may be useful.

**Joanne Lia**

**Director | Certified Building Biologist**

NoToxRox Building Biology Services

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**Contact Information**

**Email:** info@notoxrox.com

**Phone:** 1300 833 689

**Location:** Sydney Metro Area, NSW, Australia

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**Professional Summary**

Certified Building Biologist with over a decade of experience in evaluating and mitigating health hazards in the built environment. Director of NoToxRox Building Biology Services, specializing in mould assessment, water damage restoration, and electromagnetic field (EMF) testing. Adept at providing comprehensive strategies to address indoor air quality, moisture control, and environmental health risks. A strong advocate for preventive solutions to create healthier indoor spaces, with a commitment to continuous professional development.

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**Education and Certifications**

- **Australian College of Environmental Studies (ACES)**
    - Building Biology Certification, 2014
    - Advanced Training:
      - Mould Technician (BLDBIO606)
      - Mould Testing and Destructive Sampling (RTO21740)
    - Nationally Accredited Electromagnetic Field Testing (BLDBIO602)
  - **Institute of Inspection Cleaning and Restoration Certification (IICRC)**
    - Water Damage Restoration Certification
    - Applied Microbial Remediation Technician Certification
    - Post-Remediation Verification Training
- 

**Professional Experience**

**Director | Certified Building Biologist**

**NoToxRox Building Biology Services | 2011 – Present**

- Founded and successfully built a trusted consultancy focused on health hazards in the built environment.
  - Conduct mould and moisture assessments, water damage investigations, and air quality testing for residential and commercial clients.
  - Perform advanced electromagnetic field (EMF) testing to identify and mitigate potential health risks.
  - Provide actionable strategies for source control and exposure reduction, improving client well-being and property health.
  - Collaborate with remediation professionals, architects, and builders to implement tailored solutions for clients.
  - Deliver educational presentations and training on mould, EMF, and building health to community groups and industry professionals.
-

## Professional Memberships

- **Australasian Society of Building Biologists (ASBB)** – Member
  - **Institute of Inspection Cleaning and Restoration Certification (IICRC)** – Member
  - **Lead Group Australia** – Member
- 

## Key Skills

- Mould and moisture investigation
  - Indoor air quality assessment
  - Electromagnetic field (EMF) testing
  - Water damage restoration
  - Post-remediation verification
  - Health-focused building consultancy
  - Preventive strategies for environmental hazards
- 

## Achievements

- Over a decade of professional practice as a certified building biologist.
  - Recognized expert in mould remediation and EMF testing, with advanced certifications.
  - Contributed to healthier living environments for countless clients through precise assessments and tailored solutions.
- 

## Professional Development

- Continuous ongoing training in building biology, environmental health, and restoration sciences.

This CV reflects Joanne Lia's expertise, professional achievements, and commitment to healthier indoor environments, making her a leading authority in her field.



**CERTIFICATE OF CALIBRATION**

NoToxRox  
 10 Midelton Ave  
 Nth Bondi  
 NSW, 2026

Attention: Joanne Lia

Report: 1309187-ML

<b>Manufacturer:</b>	Zefon International	<b>Calibration Date:</b>	05/01/2026
<b>Model Number:</b>	ZBP-205	<b>Calibration Due Date:</b>	01/2027
<b>Description:</b>	Bio Pump Plus	<b>Calibration Interval:</b>	12 months
<b>Asset Number:</b>	N/A	<b>Condition as Found:</b>	OK
<b>Serial Number:</b>	4361	<b>Condition as Left:</b>	OK
<b>Temperature:</b>	19°C	<b>Procedure:</b>	QS-INS-6009
<b>Timer:</b>	10 min	<b>Relative Humidity:</b>	30%
<b>Primary Air Flow Calibrator:</b>	TSI 4000	<b>TSI Calibrator Serial No:</b>	#4046 1419 002
<b>Calibration Adapter:</b>	ZBP-302	<b>Airflow indicator ZBP-302 Air-O-Cell Cassette</b>	B-11637
<b>Powerpak Voltage Output:</b>	N/A		

**Remarks:** The item described has been calibrated using in-house procedure. All measurements have been made using a flow meter traceable to NIST and timers that have been checked according to [NMI Web Timer](#). Test conditions as described above.

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### TEST RESULTS

The results of this report relate only to the items tested and calibrated as detailed above.

BEFORE CALIBRATION		AFTER CALIBRATION	
	ACTUAL		ACTUAL
	Litres/min		Litres/min
1	15.30	1	15.13
2	15.33	2	15.09
3	15.18	3	15.14
4	15.16	4	15.14
5	15.12	5	15.04
6	15.12	6	15.09
7	15.15	7	15.06
8	15.18	8	15.12
9	15.17	9	15.15
10	15.15	10	15.09
Mean	15.19	Mean	15.11
SD	0.07	SD	0.04
CV%	0.45	CV%	0.23

These results confirm the calibration limits provided by the equipment manufacturer of  $\pm 5\%$  have been attained

For and on behalf of  
**Eurofins Environment Testing Australia Pty Ltd**



**Cimona Fernandes**  
**Mould Team Leader**

**13 January 2026**

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