Submission No 3

INQUIRY INTO CLEAN INDOOR AIR

Organisation: Mycotox

Date Received: 14 January 2026

The Committee
NSW Government Inquiry into Clean Indoor Air
Parliament of New South Wales
Sydney, NSW

Dear Committee Members,

Thank you for the opportunity to contribute to the NSW Government Inquiry into Clean Indoor Air.

My name is **Vince Neil**, and for more than 30 years I have assessed contaminated buildings and the health of the people living in them. I have co-authored scientific papers and wrote ***The Little Black Book of Mould and Bacteria,*** but none of that is of a huge importance..

What truly matters — and why I am writing to you today — is the simple truth is, that we now have **the technology to change lives,** research has already been established and published.

I have seen a non-verbal autistic child **become verbal** after leaving a contaminated building, Installed catalytic air systems and bring about in one case in under a week non-verbal to verbal. Parkinsons patient back to riding a horse after treating his indoor environment.
I have seen families regain their health after years of unexplained illness.
These are not miracles, its simply what clean indoor air can do.

This inquiry **should not be about regulations, paperwork, academics or those even within the medical field.**
It is about **human outcomes**, especially for those who do not have the power or resources to demand safe housing.

In Testing we Are Missing the Real Triggers in Indoor Air.

For decades, the scientific tools available to us were limited. Culture plates. Spore traps. "Visible mould."
But today the technology has transformed — and yet **most of the industry has not.**
Some organisations still chase profit, not outcomes. And as a result, children, families, and vulnerable communities continue to suffer needlessly.

With modern diagnostics such as **Next-Generation Sequencing (NGS)** and **DNA-based microbial testing**, we now know that a water-damaged building is not just about mould.
It is an **ecosystem of harmful organisms which can produce chemicals and toxins**, (1,2,3) including:

- Fungi
- Bacteria (Actinomycetes, Mycobacteria, Gram-negative species)
- **Cyanobacteria** (blue-green algae capable of producing neurotoxins)
- **Protozoa living inside biofilms — the true hosts for many dangerous pathogens**

Through NGS, we are detecting **Legionella species in water-damaged buildings** — something that would have been dismissed as impossible a decade ago. But it is real, and it is happening now.(4,5,6)- Here is a recent example of what we have found in a water damaged buildings, where the owner has been diagnosed with cardiac arrhythmia

"The detection of eight Legionella species, including* L. waltersii, L. shakespearei, L. feeleii*, and* L. drancourtii*, indicates significant water-damage–associated biofilm contamination. These species are recognised causes of pneumonia, non-pneumonic legionellosis, respiratory irritation, and systemic inflammatory symptoms. Their presence confirms ongoing moisture-related microbial amplification and poses health risks, especially to vulnerable occupants."

Yet, despite this knowledge, **most reports conducted in 2025–2026 still fail to include bacterial testing at all.**

We cannot protect public health if we refuse to look.

The People Most Harmed Are the Ones With the Least Voice

- Lower socio-economic families.
- First Nations communities.
- Residents of Government housing.

These are the people living in conditions where water damage is ignored, hidden, or patched over with paint, even though some occupants are ill.(7,8,9)

Less spent on repairs equals more profit — and children pay the price.

If we don't understand the exposures, we will never link the health problems to the environment.
Many people suffer silently because no one has ever examined the *real* triggers in their home, they are simply told it's all in your head.

Its inhuman to continue to fail them.

Indoor Exposures Can Trigger Profound Immune Reactions

We all know that substances such as:

- wood smoke
- tobacco
- vaping chemicals
- illicit drugs
- alcohol can trigger immune responses.

Alcohol, for example, is one of the strongest natural **mast-cell degranulators**, and its effects are dramatically amplified in individuals with a **Chronic Inflammatory Response Syndrome (CIRS)** due to water-damaged buildings. But in water-damaged buildings, there are additional, *harder-to-see* triggers:

Endotoxins (LPS) from Gram-negative bacteria

These are potent neuroimmune activators (10,11,12) that can:

- increase blood-brain barrier permeability
- activate microglia
- disrupt cognition
- worsen neurological symptoms

Children with autism exposed to bacterial endotoxins show increased expression of the **TLR4, TLR2, and MMP9 gene expressions**— markers of heightened inflammation and impaired neurological resilience.

Endotoxins (LPS) are potent inflammatory molecules released by Gram-negative bacteria. Numerous studies (Douwes 2003; Park 2000; WHO 2009; IOM 2004) show that LPS levels increase dramatically in damp or water-damaged buildings. LPS activates TLR4, triggers respiratory symptoms, systemic inflammation, and contributes to the neuroimmune impacts reported in moisture-affected homes.

Long-term low-dose exposures — the kind found in contaminated homes — can disrupt brain function **without causing a fever or obvious infection**. This is why many people are sick, but their doctors cannot explain why or find a cause.

To Create a Clean Indoor Air Framework, You Must First Understand the Exposure

The current approach — visually assessing mould or relying on outdated air sampling — cannot deliver meaningful health outcomes.

A 100-page report using the wrong tools is still the wrong report.

Indoor Air Quality (IAQ) assessments must reflect:

- *the reality of complex microbial ecosystems*
- *the presence of biofilms*
- *bacterial endotoxins*
- *cyanobacteria*
- *protozoa*
- *toxins and inflammatory triggers that cannot be cultured or "seen"*

And this requires the tools which are available here and Internationally:

1. Next-Generation Sequencing (NGS) for bacteria

2. DNA-based testing for mould and fungi

3. Gene expression testing to identify inflammatory pathways

4. Moisture mapping and building envelope diagnostics

5. Whole-genome metagenomics for complex or high-risk sites

No this is Not futuristic.
Not experimental.
This is modern science — available today.

A User-Friendly Summary of Testing Methods (Explained With Passion and Clarity)

Traditional Air Sampling (Culture Plates & Spore Traps)

- Outdated
- Misses 90% of relevant organisms
- Cannot detect bacteria, cyanobacteria, endotoxins, or biofilms
- Should no longer be used as the primary assessment method

Particle Monitoring (PM1/2.5)

- Good for smoke and dust
- Cannot identify what the particles *are*

Moisture Mapping

- Essential
- Dampness predicts microbial growth better than anything else

DNA-Based Testing for Mould (ERMI / HERTSMI / MSqPCR)

- Better than culture
- Still limited in scope

Next-Generation Sequencing (NGS)

- Game-changing
- Detects entire bacterial communities
- Finds Actinomycetes, Mycobacteria, Legionella, cyanobacteria and more
- Shows long-term exposure in settled dust
- Essential for water-damaged buildings

Metagenomics (Whole Genome)

- The most advanced tool available
- Identifies bacteria, fungi, protozoa, viruses and toxin genes
- Ideal for hospitals, schools, aged-care and complex cases

Chemical Testing (VOC/MVOC)

- Useful but incomplete
- Must be paired with microbial analysis

Recommendations for the NSW Clean Indoor Air Framework

1. **Formally recognise NGS and DNA-based microbial testing.**
2. **Make moisture assessment mandatory.**
3. **Include bacterial contaminants and biofilms in IAQ guidelines.**
4. **Acknowledge cyanobacteria and their toxins in risk assessments.**
5. **Develop health-based IAQ benchmarks aligned with clinical practice.**
6. **Create clear remediation verification standards.**
7. **Require standardised reporting to ensure transparency and accountability.**

T***his is how we in NSW become National Leaders within this Field.***

Conclusions

We are standing at the edge of transformational technology.
We now have the tools to identify the *real* triggers in our indoor environments — the triggers that affect cognition, behaviour, asthma, chronic illness, and the neurological development of our children.(13,14,15)

A strong Clean Indoor Air Framework will protect families, safeguard First Nations communities, and reduce the economic burden of chronic illness within all Australians.
I welcome the opportunity to provide further clarification, contribute data, or appear before the Committee.

Mycotox Australia remains committed to improving indoor environments and protecting the health of all Australians.

Sincerely,
Vince Neil
Principal Consultant

Join Us because Somewhere, something Incredible is waiting to be Discovered

References

1. **Andersson MA et al. (1997).**
   Toxicity of house dust from water-damaged buildings.
   Environmental Health Perspectives, 105(S3): 633–639.
2. **Pasanen A-L. (2001).**
   A review: Microbial growth on building materials.
   Indoor Air, 11(3): 211–220.
3. **Rintala H et al. (2008).**
   Toxic bacterial metabolites in indoor dust.
   Indoor Air, 18(4): 275–284.
4. **Feazel LM, Baumgartner LK, Peterson KL, et al.**
   Opportunistic pathogens enriched in showerhead biofilms.
   PNAS, 2009;106(38):16393–16399.
5. **Shelton et al. 2002** — Legionella frequently detected in damp buildings
   Shelton BG, Kirkland KH, Flanders WD, Morris GK.Aerosolized microorganisms found in indoor air..Journal of Occupational and Environmental Hygiene, 2002.
6. **WHO (2007, 2009) — Water-damaged buildings harbour Legionella**
   World Health Organization.
   Legionella and the prevention of legionellosis. WHO Press, 2007.
   WHO Guidelines for Indoor Air Quality: Dampness and Mould, 2009.
7. **Public Housing Has High Rates of Moisture Problems, Dampness & Structural Decay**
   Australian Housing and Urban Research Institute (AHURI) Baker E, Beer A, Lester L. (2016).
8. **NSW Auditor-General Report**
   Audit Office of NSW (2020).
   Managing Tenancy Services in Social Housing. Identifies systemic issues including **delayed repairs**, unresolved leaks, high rates of dampness, and maintenance failures in NSW public housing.
9. **Water Damage, Poor Maintenance & Neglect in Public Housing** (NSW, Australia)
   NSW Tenants' Union – Housing Habitability Reports-Tenants' Union NSW (2021).
10. **Douwes et al. (2003) – Core review on LPS exposure and health-** Douwes J, Thorne P, Pearce N, Heederik D.Bioaerosol health effects and exposure assessment: progress and prospects. Annals of Occupational Hygiene, 2003;47(3):187–200.
11. **Thorn & Rylander (1998) – Inhalation of indoor LPS causes inflammation**-Thorn J, Rylander R. Inhalation of endotoxin from indoor sources. Journal of Occupational and Environmental Medicine, 1998;40(5): 433–437.
12. **Kallawicha et al. (2021) – LPS detected in damp building materials-**Kallawicha K, Täubel M, Nevalainen A.Microbial and endotoxin profiles in indoor environments. Science of the Total Environment, 2021.
13. **Indoor Environments Contain Complex Microbial Ecologies (Not Just Mould)** Rintala H et al. (2008).Toxic bacterial metabolites in indoor dust. Indoor Air, 18(4): 275–284.
14. **Cyanobacteria and Their Toxins Are Present Indoors — Often Totally Missed-**Scott JA. (2001). Microscopic cyanobacteria in moisture-damaged buildings. International Biodeterioration & Biodegradation, 48:1–12.
15. **Biofilms in Indoor Environments Protect and Amplify Hidden Microbial Triggers**
    Flemming H-C et al. (2016). Biofilms — the microbial world's protective suit.
    Nature Reviews Microbiology, 14:563–575.