

THE IMPORTANCE OF INDOOR ENVIRONMENTAL PROFESSIONALS IN INVESTIGATIVE AND REMEDIAL PROJECTS

Together with experience, a critical aspect of using the services of an IEP on a project is their independence from the restoration contractor.

The term Indoor Environmental Professional (IEP) is used to describe a professional who assesses building-related microbial and associated impacts. The phrase was originally coined by the Institute of Inspection, Cleaning and Restoration Certification (IICRC) in December 2003 in the 'Standard and Reference Guide for Professional Mold Remediation, Standard S520'.

The IICRC have confirmed that the definition of an IEP is a generic industry term for:

"An individual who is qualified by knowledge, skill, education, training, certification, and experience to perform an assessment of the microbial ecology of structures, systems, and contents at a job site, create a sampling strategy, sample the indoor environment and submit to an appropriate laboratory and interpret laboratory data... for the purpose of establishing a scope of work and verifying the return to a normal microbial ecology".¹

There are number of Australian guidance documents for mould management including the *Australian Mould Guideline (AMG-2005-1)* produced by Mycologia Australia and the *Guidelines for Managing Mould and Dampness Related Public Health Risks in Buildings* produced by the Western Australia Department of Health (WA Health).

Indoor Environmental Professional (IEP)

IEPs come from many backgrounds and professional disciplines such as:

- Occupational (Industrial) Hygiene
- Building Biology
- Engineering
- Indoor Air Quality
- Health and Safety

In order to protect the term 'IEP' against use in certification programs that fail to adequately measure competence, experience and education, the IICRC have stated that there is no single designation, license, or certification that qualifies an IEP.

The qualifications required for an IEP are often gained through years of formal study at university level, specific training related to mould and the indoor environment, and years of on-the-job work experience, or a combination of these factors.²

The IEP must provide unbiased, independent third party advice and in no way should have ownership or affiliation with the remediation/cleaning contractor used in the restoration project.

So what technical knowledge does an IEP have?

The American Industrial Hygiene Association (AIHA) has identified eight technical areas in which IEPs should have knowledge in:

- 1) Exposure Assessment
- 2) Indoor Environmental Quality
- 3) Microbial Assessment and Remediation
- 4) Microbiology/ Mycology
- 5) Heating, Ventilating, and Air Conditioning (HVAC)
- 6) Building Science
- 7) Legal/ Communication
- 8) Health Effects

It is rare for an IEP to have expert knowledge across all 8 areas. An experienced IEP is often a member of a multi-disciplinary team or has access to suitably qualified experts who can complement their own expertise.³

A multi-disciplinary approach is also considered by the IICRC to be especially important for complex microbial assessments and remediation projects.

Common Issues IEPs are Engaged to Investigate/ Manage

The following are examples of common building issues IEPs are engaged to investigate/ manage the remediation process.

Poor Drainage & Subfloor Ventilation

The issue of uncontrolled subfloor microbial growth can be found within timber subfloor areas where there isn't sufficient ventilation or drainage provided. A build up significant airborne moisture or water inundation as a result of a one off event or ongoing poor ventilation can result in significant mould growth to subfloor materials and soils. These conditions can have a dramatic impact on indoor air quality within the occupied areas of a building due to air transfer between subfloor and habitable areas as a result of pressure differentials caused by external/ internal conditions.

Dew Point Condensation

Inadequate insulation to building materials/structures can result in mould growth as a result of dewpoint condensation occurring from warm moist air interacting with colder surfaces. The mould growth can either occur directly on the cooler surfaces themselves e.g. plasterboard ceiling linings where no insulation is present, or manifest on adjacent surfaces to the colder surfaces e.g. within ceiling voids. Experience in psychometry, the properties of air and water vapour mixtures, and how this impacts building materials is required to understand and ultimately rectify these issues.

Ongoing Source

Undetected moisture ingress from leaking pipes/roof coverings into building materials can provide an optimal environment for ongoing mould growth. Leaks can occur due to pressure increases in supply pipework, pipework corrosion/ degradation, or pipe breakage which may occur as a result of structural movement. Each event may cause water leakage that may not be detected for extended periods. Such events will not only provide the ideal moisture for mould growth but the water may also be a source of significant pathogenic bacteria.

A detailed understanding of the level of moisture/ microbial impacts and the required cleaning/ restoration techniques to return levels to within a range considered normal ecology are needed for successful remediation. Independence from the remediation process in order to determine what works are required is critical for economic and successful remediation of such issues.

The IICRC state that an IEP must be considered where:

- There is microbial contamination that could cause harm to occupant health;
- High risk occupants are present (e.g. healthcare, elderly care or childcare facilities); or
- Public health issues exist

What does an IEP do?

IEPs generally perform the following three tasks:

- **Initial Investigations** to determine the nature and extent of microbial contamination in order to develop an independent scope of remedial works.
- **Interim Assessments** during the remedial process in order to provide ongoing advice into the refinement of a scope of works due to site or project complexities.
- **Independent Post Remediation Verification (PRV)** of remedial works.

IEPs Assessment Tools & Techniques:

- **Visual Inspection** (generally non-destructive) using the naked eye and photographic means including borescope inspection cameras for the hard to inspect areas.
- **Real-time Measurements** including airborne moisture and building material moisture levels.
- **Representative Airborne and Surface Sampling** for microbial contaminants (mould and bacteria).

The experience of the IEP and information provided by the owner, occupier and manager of the property will dictate the complexity of the assessment required.

Many variations of assessments exist within the IEP market place. For example some IEPs only collect viable mould samples (agar plates used for culturing mould which is indicative of the reproduction level of mould) without sampling for total moulds (the combination for viable and non-viable mould - living and dead moulds).

Why engage an IEP?

IEPs are engaged to provide guidance/ undertake assessments because they are industry recognised experts in the field of microbial assessment and post remediation verification who can:

- Provide unbiased, scientific, independent advice from the assessment and throughout the remediation process
- Greatly assist with protecting health and wellbeing of the occupants and remediation/ cleaning contractors
- Mitigate loss (time, money, reputation etc)
- Prevent litigation and also reduce remedial costs/ settlement amounts in insurance claims

When IEPs are not engaged there is greater risk of the following consequences occurring:

- Structural damage
- Infrastructure degradation
- Microbial off-gassing (odours)
- Occupant complaints
- Reduced productivity and increased absenteeism
- Damage to contents and belongings

Industry experience has shown that human health can be affected by both living and dead mould and therefore reliance on viable mould sampling could fail to characterise the full extent of mould impacts.

Even on the limited available data, the adverse health implications of indoor air quality have very significant economic effects. A CSIRO estimate (CSIRO 1998) is that poor indoor air quality costs Australia \$12 billion per annum.

- Indoor Air Quality in Australia ⁴

In the US, the EPA (Environmental Protection Agency) and NIOSH (the National Institute for Occupational Safety and Health) have undertaken studies and have estimated productivity losses in the tens of billions of dollars annually due to poor indoor air quality.

These losses are associated with:

- Health care costs
- Absenteeism
- Reduced worker productivity
- Lower earnings
- Costs of investigative improvements

What are some projects that IEPs are involved in?

Water damage building (WDB) assessments

Assessments are generally undertaken after the discovery of water/ moisture intrusion which has occurred within buildings and as a result microbial growth (mould and or bacteria) has potentially occurred.

The assessment should:

- Determine the extent and nature of microbial impacts
- Develop a remedial scope works in accordance with industry best practice
- Verify that these works have been conducted adequately

General remediation principles that should be employed during such a project include:

- Determination of extent and nature of microbial impacts
- Make safe works and an assessment on the suitability of ongoing occupancy
- Rectification of water/ moisture ingress
- Containment or other suitable engineer controls
- Determination of what materials can be restored
- Removal of mould impacts
- Cleaning
- Structural Drying
- Post Remediation Verification (PRV)
- Reinstatement works after successful PRV Assessment

Heating Ventilation and Air-conditioning (HVAC) System Assessments

HVAC assessments determine hygiene levels within plant and ductwork, which components and areas need cleaning and by what techniques.

Post remediation verification (PRV) of such plant and systems prior to recommissioning is recommended.

Guidance can also be given with regard to ongoing inspection and maintenance requirements in accordance with local and national standards/ guidelines.

High Risk Manufactured Water Systems Legionella Assessments

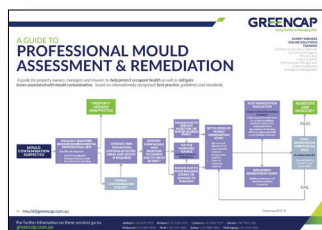
Assessment generally comprises a combination of inspection (plant and systems) and desktop study (maintenance records/ laboratory results) in order to determine compliancy with local and national standards and guidelines.

Indoor Air Quality Assessments for Clean Rooms

Assessments are generally undertaken after the completion of detailed cleaning of clean rooms e.g. theatres and pharmacies and their HVAC systems, following building works, in order to verify cleaning has been to appropriate standards.

Verification works are conducted in accordance with facility requirements and or local health department guidelines.

Grencap has developed a quick guide to Professional Mould Assessment & Remediation which is available for download from our website



[Click Here to view](#)

Case Study 1: Drainage Water Flooding (Commercial Property)

Situation:

Maintenance contractors caused major water ingress to a shop front. The contractors then attempted to rectify water impacts themselves using the wrong equipment and techniques. By using heating and air movement equipment only, they were not undertaking airborne moisture extraction procedures. This resulted in elevated humidity levels which had caused moisture to condense on non-flood impacted surfaces and content. If not rectified quickly would have resulted in mould growth.

The Role of the IEP:

The property manager engaged an IEP who attended site with an experienced remediation contractor within 48hrs of event. The IEP developed and implemented a safe scope of works (including water extraction/ drying) and then managed the remedial works from the onset so no subsequent mould growth could occur on building materials and the remaining shop contents.

Benefits:

The IEP mitigated mould growth and therefore significantly reduced losses for the property manager/ building owner by preventing mould re-occurrence and minimising structural damage. Cost savings have been estimated to be in the tens of thousands of dollars in loss of rent, replacement of contents, project remedial works and contractor costs.

Case Study 2: Ongoing Subfloor Water Leak (Residential Property)

Situation/ Role of the IEP:

The Restoration Contractor engaged an IEP from the onset of an insurance claim allocation who detected major subfloor moisture and mould impacts resulting in a detailed independent scope of works being developed.

Scope of works was implemented in full by an experienced Remediation Contractor who was in regular communication with the IEP throughout remedial works (2.5 months project duration - from first engagement to final mould remediation verification).

Post Remediation Verification assessment was undertaken and passed.

Benefits:

Project time and costs were significantly reduced as a result of engaging an IEP to carry out a full assessment from the onset. Cost savings have been estimated to be in the vicinity of \$60,000 - \$80,000 in accommodation, project remedial works and professional/trade. The early IEP engagement also saved time, reputation, inconvenience and stress for the home owner.

For further information, please visit: grencap.com.au
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