IN THE MATTER of the *Heritage Act* 1995 [the Heritage Act]

and

IN THE MATTER of Heritage Council Appeal Hearing No. P25759 concerning Spurling House - 38 Black Street, Brighton (HO126).

STATEMENT OF DAVID LARK

This statement has been prepared by David Lark, Mycologist, of NSJ EnrivoSciences Pty Ltd, t/a MouldLab, of Unit 4/52 Industrial Drive, Mayfield East, New South Wales.

1. My qualifications are as follows:

   - Diploma of Medical Laboratory Sciences, Australian Institute of Medical Sciences (1972)
   - Degree in Applied Sciences, Charles Sturt University (1979) majoring in Microbiology and Analytical Chemistry
   - Council Certified Indoor Environmental Consultant #1404014, ACAC
   - Council Certified Microbial Consultant #1403008, ACAC
   - McCrone Institute, Chicago IL. Advanced Indoor Air Quality – Fungal Spore Identification Course, Aug. 2013
   - Medical Mycology Course, Centraalbureau Voor Schimmelcultures (CBS) Fungal Biodiversity Centre, Utrecht, The Netherlands - Nov, 2014
   - Mycology of Food & Airborne Fungi, Centraalbureau Voor Schimmelcultures (CBS) Fungal Biodiversity Centre, Utrecht, The Netherlands - Oct, 2009

2. I have been practicing as a Microbiologist/Mycologist for over 40 years and my full Curriculum Vitae is attached.

3. I have no private or business relationship with Dr Damien Louis or Mr Anthony Gavan, except for the fee paid by them for this statement.

4. I was requested by Mr Brett Cole on 6 March 2017 to test samples provided by him to me to detect mould and determine microbial counts and predominant microbial genera in the samples provided and to detect Coliforms and E.coli in the samples provided.

5. I undertook an analysis and produced an analytical report.

6. The only assumption upon which my analytical reports proceed is that the samples provided by Mr Cole came from 38 Black Street, Brighton based on his advice to that effect.

7. On 5 May 2017 I received a Swiffer cloth sample. I tested dust extracted from these Swifter cloth samples provided to me by Mr Brett Cole and the results were as shown in the report dated 12 May 2017.

8. In my opinion whatever remedial steps are undertaken short of full demolition and removal of all contaminated material no-one will be able to guarantee the habitability of the residence at 38 Black Street, Brighton for all likely occupants particularly the quarter of the population who are genetically predisposed to the deleterious effects of biotoxin related illness.

9. Biotoxin related illness is a general term, which includes the more specific Chronic Inflammatory Response Syndrome (CIRS-WDB) which occurs only in those who are genetically predisposed to the illness. 24% of the population is genetically prone to develop CIRS if exposed to sufficient amounts of biotoxin. There is a spectrum of severity with some 2% of the population having genes that render those who are afflicted highly susceptible to disabling symptoms, in response to prolonged or recurrent exposure to biotoxins.

10. These findings are based on information gathered at four medical conferences I have attended on the subject, 2 in Australia and 2 in the USA, details of which are included in the attached CV, plus peer reviewed published papers.

11. No other documents or materials have been taken into account in reaching my opinions, other than the samples provided.

12. A summary of my opinions are contained in the conclusions in my reports of 8 March 2017 and my test results of the said Swifter cloth samples dated 12 May 2017.

13. None of my conclusions are provisional but all of which are within my expertise.

14. This statement and attachments or neither incomplete nor inaccurate in any respect.

15. Attached to this statement is a copy of my analytical reports of 8 March 2017 and 12 May 2017.

I have made all the enquires that I believe are desirable and appropriate. No matters of significance which are regarded as relevant, to my knowledge, been withheld from the Heritage Council.

I ACKNOWLEDGE that this declaration is true and correct and I make it with the understanding and belief that a person who makes a false declaration is liable to the penalties of perjury.

……
DAVID LARK

Dated: 27 May 2017

CURRICULUM VITAE

NAME:	David James Lark
DATE OF BIRTH:	6 September 1947
BUSINESS ADDRESS:	NSJ EnviroSciences Pty Ltd t/a MouldLab 4/52 Industrial Drive Mayfield East NSW 2304 Australia
TELEPHONE:	02 49688448 Mobile 0422 853 365
EMAIL:	david@mouldlab.com.au

EMPLOYMENT/ENGAGEMENT:

July 2016 - present	Principal Mycologist EnviroBiomics, Inc
July 2010 - present	Principal Mycologist NSJ EnviroSciences Pty Ltd t/a MouldLab
Jan 2009 – June 2010	Mycologist & IAQ Assessor Manager - Sydney Office & Laboratory Mycologia Pty Ltd
2008 - 2009	Principal Scientist Integrated EnviroSciences Pty Ltd
2007-2008	Director/Principal Scientist AirQual Pty Ltd
2006 – 2007	Research Director Vaporex Pty Ltd
2004 – 2006	Environmental Consultant Enviroair Pty Ltd
2003-2004	Research & Development Manager Nanosonics Ltd
2000-2003	Research Director Vaporex Pty Ltd
1996-2000	Consultant Microbiologist BOC Gases Aust. Ltd
1996-2005	Director/Consultant Microbiologist Lark Technologies Pty Ltd
1993-1996	Research Scientist Micron R & D

1991-1993	Medical Scientist S & N Pathology Director/Consultant
1984-1991	Microbiologist Associated Sciences Pty Ltd
1983-1984	Laboratory Manager, Pathology, RGH Concord
1979-1983	Medical Microbiologist Microbiology Department RGH Concord
1970-1979	Medical Scientist Renal Unit RGH Concord
1969-1970	Technical Officer, Grade II Australian Govt. Analytical Laboratories (formerly Dept. Customs & Excise)
1967-1969	Medical Laboratory Technologist St George Hospital, Kogarah
1966-1967	Technical Officer Merck, Sharpe & Dohme, Veterinary R&D Lab, Campbelltown
1964-1966	Technical Assistant CSIRO McMaster Laboratory, University of Sydney

EDUCATIONAL DETAILS:

- Biology Certificate, Sydney Tech. (1968)
- Diploma of Medical Laboratory Sciences, Australian Institute of Medical Sciences (1972)
- Degree in Applied Sciences, Charles Sturt University (1979) majoring in Microbiology and Analytical Chemistry
- Short Course, Medical Application of Radioisotopes, ANSTO
- Short Course, Medical Statistics, Macquarie University
- OH&S Accredited Safety Auditor, Accreditation No. 2270 issued by Minerva Consulting Group Pty Ltd, approved by WorkCover NSW.
- Certificate IV in Training & Assessment, TAE101101, HBA Learning Centre

ACCREDITATIONS:

- Council Certified Indoor Environmental Consultant #1404014, ACAC
- Council Certified Microbial Consultant #1403008, ACAC
- McCrone Institute, Chicago IL. Advanced Indoor Air Quality – Fungal Spore Identification Course, Aug. 2013 presented by Dr John Haines
- Medical Mycology Course, Centraalbureau Voor Schimmelcultures (CBS) Fungal Biodiversity Centre, Utrecht, The Netherlands - Nov, 2014
- Mycology of Food & Airborne Fungi, Centraalbureau Voor Schimmelcultures (CBS) Fungal Biodiversity Centre, Utrecht, The Netherlands - Oct, 2009

MEMBERSHIPS:

Membership has been granted by the following Professional Bodies

- ASTM Committee D22.08 – Indoor Air Quality (ASTM)
- American Industrial Hygiene Association (AIHA)
- International Society of Animal & Human Mycology (ISHAM)
- Australasian Society of Mycology
- Australian Society for Microbiology (ASM)
- Australian Institute of Medical Sciences (AIMS)
- Clean Air Society of Australia & New Zealand (CASANZ)
- Indoor Air Quality Association (IAQA)
- International Society for Mycotoxicology
- International Society for Indoor Air Quality & Climate (ISIAQ)

PATENTS, PUBLICATIONS & PRESENTATIONS:

As co-inventor of over 10 Australian and International granted patents for applications to control microbial growth, especially moulds in environments and food; the research has given a deep knowledge and familiarity with the requirements of innovating technology and the nature of mould, both from the scientific and commercial perspective.

Numerous published scientific papers and presented posters have been authored and presented at both International and Australian conferences. Most recently:-

- Comparison of Mold Populations in Water-Damaged Homes in Australia and the United States. Fungal Genom Biol 7: 152. May 2017
- AIOH Annual Conference, Royal Pines, Ashmore, Qld, Dec. 2016
- State of the Art - Mold Conference III, Irvine, CA Nov. 12-15, 2016, presented on "HERTSMI-2 and ERMI: Correlation of Human Health Risk with MSQPCR in Water-Damaged Buildings"
- ISIAQ Indoor Air, July, 2016 Ghent, Belguim – presentation No: 658, entitled "HERTSMI-2 and ERMI: Correlating Human Health Risk with Mold Specific qPCR in Water-Damaged Buildings"
- Jena Dyco Mould Conference, Melbourne, June 2016
    - Presented "The Future of Mould Sampling & Analysis–is Now"
- ASTM Technical Committee D22.08. IAQ – Mold Sampling & Analysis, San Antonio, TX, April, 2016
- IICRC Technical Conference, Atlanta GA, April, 2016
    - Presented "The Future of Mould Sampling & Analysis–is Now"
- State of the Art - Mold Conference II, Phoenix, AZ Nov. 12-15, 2015, presented on "Human Mycoses in our Environment".

- ASTM Technical Committee D22.08. IAQ – Mold Sampling & Analysis, Tampa, FL, Oct. 2015

- Mould & Chronic Inflammatory Response Syndrome Conference, Brisbane (Public) & Sydney (Medical), March, 2015
  - Presented "Advanced Mould Sampling & Assessment in Moisture Impacted Buildings"

- International Congress of Aerobiology , UWS Sydney, September, 2014
  - presented on "Microbial Contaminants in Water Damaged Buildings"

- Institute of Building Consultants – Sydney Meeting, September 2014 –
  - presented on "Biocontaminants in Water Damaged Buildings"

- AIOH, August 2014
  - Attended I day workshop presented by Brad Prezant, MSPH, MBA, COH, CIH, CPE, "Advanced Mould – Managing & Evaluating Moisture Impacted Buildings"

- Restorx Seminar, August 2014
  - Presented on "Mould in Water Damaged Buildings"

- AIOH, NSW Branch, July 2014
  - Presented on "Advanced Moudl Sampling V3"

- Jena Dyco Mould Conference, Melbourne, May, 2014
  - presented on "Advanced Mould Sampling & Analysis"

- CASANZ 20th International Clean Air & Environment Conference, Aug 2011, Auckland, NZ
  - Presented poster on "Mould in Apartment Linked to Occupant Illness & Death"

- CASANZ Indoor Air Quality Training Course: Standards and Guidelines – "What to Measure, How and Why?" 6th September 2009, Perth WA, presented on
  - IAQ parameters & ventilation
  - CO2, CO, Temperature, dew point and relative humidity
  - Problems, health effects and case studies
  - Measurements, sampling & interpreting data

- CASANZ 19th International Clean Air & Environment Conference, Sept. 2009 Perth WA

  Presented on "Mould Contamination of Medical Records Linked to Illness in Exposed Staff"

- AIOH 2009 Conference, December 2009 Canberra,ACT
  - "Mould Contamination of Medical Records Linked to Illness in Exposed Staff – an Update"

OVERSEAS EXPERIENCE:

Considerable overseas perspective has been added to my local experience including:-

- ISIAQ Indoor Air Conference, July 2016, Ghent Belgium
- Plant Visit, Zefon Inc., Ocala, FL, Oct. 2015
- ISIAQ Indoor Air July, 2014, Hong Kong, including all sessions presented by the Alfred P. Sloan Foundation sponsored researchers on the interaction between the "Human Microbiome and the Environment".
- IAQA Annual Conference, Nashville TN, March, 2014, including pre-conference workshop presented by Dr Joe Spurgeon on "Advanced Microbial Sampling & Analysis"
- Indoor Sciences, LLC preparation course, CIEC & CMC, Chicago, IL
- AIOH Pre-Conference Workshops presented by Brad Prezant on "Advanced Mould Assessment" and Mario Touma - "Expert Evidence Workshop", December, 2013
- IAQ Training Institute, Hidden Valley, PA – Intermediate & Advanced Course – Indoor Environmentalist, Aug. 2014
- McCrone Institute, Chicago IL. Advanced Indoor Air Quality – Fungal Spore Identification Course, Aug. 2013 presented by Dr John Haines
- Completion of ACAC accreditation exams, March 2014:-
  - Council Certified Indoor Environmental Consultant (CIEC)
  - Council Certified Microbial Consultant (CMC)
- Presentation to Product Microbiology Group – EcoLab., St Paul, Mn, 2004
- Research trials at laboratories of leading US industrial microwave manufacturers
  - Ferrite, Hudson, Mass. – 2004
  - Amtek, Cedar Rapids, Iowa – 2004
- Presentation of the Vaporex microbial control technology to the project development group of Ranks Hovis McDowell, Windsor, UK, Jan. 2002

- Meeting with Senior Management, Marks & Spencer Food Technology group, London, Jan. 2002
- Attendance at International Bakery Industry Expo, Las Vegas, Sept, 2001
- Successful audience with US Patent Examiner, Washington DC, Sept, 2000
- Subsequent business meetings with BOC Gases USA, Murray Hill, NJ
- Attendance at World Wide Food Expo, Chicago, Oct. 1999
- Co-operative evaluation of Vaporex methods for sliced meats - R & D Labs., Hormel Foods, Austin, MN - Oct, 1999
- Attendance at International Poultry Expo, Atlanta, GA, Feb. 1999 and visits to US food manufacturers in Georgia, Minnesota and Texas.
- Consultancy to Tenaga Nasionale, Kuala Lumpur, Malaysia, 1994
- Consultancy to Kuan Ming Gelatine, Hsin Su, Taiwan, 1988

EXPERT WITNESS

Appeared as Expert Witness on numerous occasions in several jurisdictions including:-

- Supreme Court, NSW
- NCAT, NSW
- QCAT, Qld
- VCAT, Vic.

PRACTICAL EXPERIENCE:

As a professional practicing scientist with specialisations in microbiology and mycology for over forty years, commencing at CSIRO, McMaster Laboratory, a diverse experience has been gained.

While completing my training, initially as a medical scientist then as a microbiologist I was employed by Merck, Sharpe & Dohme, R&D Laboratories, Campbelltown and the Pathology Dept., St George Hospital, Kogarah.

Having completed the requirements and being awarded a Diploma of Medical Laboratory Sciences from the Australian Institute for Medical Sciences, I was employed Medical Laboratory Scientist in the Pathology Departments of several large Sydney hospitals, including RGH Concord, where I was also employed in the Renal Unit, with dual responsibilities of laboratory support for medical research in bone metabolism & operational responsibilities for the scientific aspects of service provision to home dialysis patients throughout Australia, with annual budgets between $5-10 million.

After moving back to Pathology at Concord for 4 years in Microbiology, then as Laboratory Manager for a further 2 years, I successfully established and operated a consulting & analytical microbiology company, providing services to a wide range of industries with a strong environmental, product development and process solutions focus.

Versatility and knowledge have provided the opportunities to develop my special interests in food preservation, plus the application of natural science to better facilitate a range of environmentally responsible solutions for our World.

I am conversant with the ever increasing needs to provide safe, harmonious work & home environments for us to occupy and have been utilising my skills as a microbiologist, with specialisation in mycology, to this end. Solving mould issues wherever they present is the object of the work being undertaken at Mouldlab.

Much emphasis has been placed on the Heating, Ventilation & Air Conditioning sector of industry, leading to an invitation to become a founding member of the HVAC Hygiene Association of Australia. This was created within AIRAH, with the task of developing an industry guideline to regulate and professionalise the air conditioning duct hygiene industry.

NSJ EnviroSciences Pty Ltd
t/a MouldLab

ABN 27 143 789 995

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ANALYTICAL REPORT

CLIENT:	Biosafety Pty Ltd Unit 15, 69 Acacia Road Ferntree Gully VIC 3156
PROPERTY:	38 Black Street Brighton VIC 3186 Your Ref: 20170010
PURPOSE OF THIS REPORT:	To detect mould present and determine microbial counts and predominant microbial genera in the samples taken from within the premises pre-remediation. To detect Coliforms and E.coli present in the sample taken from within the premises pre-remediation.
DATE OF SAMPLING:	1 March 2017
SAMPLED BY:	Brett Cole
DATE SAMPLE/S RECEIVED:	6 March 2017
DATE OF REPORT:	8 March 2017
PREPARED BY:	Jill Lark (ZB)
REPORTED AND RELEASED BY:	David Lark Mycologist
OUR REFERENCE:	170542

AIHA Environmental Microbiology Proficiency Program
EMPAT Proficient Lab. No: 208121

ANALYTICAL REPORT

1 INSTRUCTIONS

1.1 Samples collected at the property were submitted by Biosafety Pty Ltd.

1.2 The purpose of the samples submitted for analysis was to detect and report on microbial content and to identify and report the presence of Coliforms and E.coli, as an index of sewage contamination, within the premises pre-remediation.

2 COMMENTARY

2.1 The samples collected were referred under chain of custody (unsigned) to our laboratory for analysis and reporting.

2.2 The samples received were labelled and their condition on receipt was intact.

2.3 This is an Analytical Report only and may not be in a format acceptable for litigation purposes because different Jurisdictions have differing requirements. Please contact MouldLab for further assistance.

2.4 Unless MouldLab has either performed the assessment from which these samples emanate or has been provided with the requisite certification from the sampler as per Reference 8, the results contained in this report should not be relied upon as the sole criteria for granting "clearance" or post remediation verification by any party.

2.5 In accordance with our Terms & Conditions this document and its contents are intended for the Addressee only and contains opinions held by the Author who prepared this report based on material available at the time of preparation and expressed for the purposes of consideration by the Addressee and is not for general publication without written consent.

2.6 Copyright of this report is retained by the Author and the Addressee is granted an exclusive licence to its contents and use only when payment for this report is received in full, in accordance with Clause 10 of MouldLab's Terms & Conditions.

2.7 Extraction or copying of this document, except in full, without the written consent of MouldLab is unauthorised.

3 RESULTS

3.1 AIR-O-CELL AIRBORNE MOULD

The results of the airborne mould detected in the samples collected from the property were tabulated as follows:

Sample	38 Black Street Brighton Vic 3186 Our Ref: 170542	Mould/M^3	Slide Area Counted %	Flow Rate l/min	Sample Time Minutes	Spores & Hyphae Counted	Fungal Hyphae	Un-Id Fungal Spores	Pollen	Gen Dirt & debris (H,M,L)	*Arthrinium spp.*	*Alternaria spp.*	*Ascomycetes*	*Aspergillus/Penicillium*	*Basidiospores*	*Bipolaris/Dreschlera*	*Chaetomium spp.*	*Cladosporium spp.*	*Curvularia spp.*	*Epicoccum spp.*	*Fusarium spp.*	*Pithomyces spp.*	*Stemphylium spp.*	*Trichoderma spp.*	*Stachybotrys spp.*	*Ulocladium spp.*	*Torula spp.*
1	External Reference	1493	25	15	5	28	2	2		M/H			3	3	9			8		1							
2	Dining Room	>22240	25	15	5	>417	9	10		H	88	1	2	>100	>100	1	6	>100									
3	Lounge	>17760	25	15	5	>333	6	21		H	39			>100	81		4	60							22		
4	Master Bedroom	>13280	25	15	5	>249	18	13		VVH	31			>100	60		17								10		
5	Bedroom #2	>8907	25	15	5	>167	7	5		VVH	34			>100	10		8	3									
	Lower limit of detection = BDL <53 Mould/M^3 @ 25%	**<100**		**<1000**		**1000 - 4225**		**4225 - 10000**		**>10000**																	
	Rating	**Low**		**Normal Mould Ecology**		**Elevated**		**High**		**Very High**																	

Elevated[5]

Further investigation is warranted when mould spores & hyphae were detected in the air at concentrations greater than 1000/M^3 .

High[5]

Where the airborne mould spore & hyphal concentration were above 4,225/M^3 active mould may have been present. The cause & source of the mould should be determined and redressed.

Very High[5]

If the airborne mould spore & hyphal concentrations exceed 10,000/M^3 all occupants should be excluded. However, if occupants have predisposing health conditions, lower exclusion limits should be considered.

The above results are discussed in the conclusions.

3.2 BIOTAPE SURFACE LIFTOFFS

The results of the surface mould detected in the samples collected from the property were tabulated as follows:

Sample	38 Black Street Brighton Vic 3186 Our Ref: 170542	Mould/cm^2	Slide Area Counted %	Fungal Hyphae	Un-Id Fungal Spores	Pollen	Gen Dirt & debris	*Acremonium spp.*	*Arthrinium spp.*	*Ascomycetes*	*Aspergillus/Penicillium*	*Basidiospores*	*Bipolaris/Dreschlera*	*Chaetomium spp.*	*Cladosporium spp.*	*Curvularia spp.*	*Epicoccum spp.*	*Fusarium spp.*	*Scopulariopsis spp.*	*Pithomyces spp.*	*Trichoderma spp.*	*Stachybotrys spp.*	*Ulocladium spp.*	*Torula spp.*
6	Dining Room	>20521	5	>100	>100		H								>3500							4		
7	Hallway	>720	5	7	15		M/H		8													>100		
8	Lounge	>28277	5	>100	4		H															>5000		
9	Bathroom	>1939	5	>250	>100		H																	
10	Master Bedroom	9	50	1	6		M/H		3					1								5		
11	Bedroom #2	>84488	5	>250			H	>5000														>10000		
12	Downstairs Heating Duct	454	5	4	16		H			1	6	18			37									
13	Upstairs Heating Duct	343	5	7	10		M/H					19			26									
14	Return Air Grill	7	50		3		M					10												
	Lower limit of detection = BDL 1 mould/cm2 @ 50%	**<50**		**<500**		**500 - 1000**		**1000 - 5000**			**>5000**													
	Rating	**Low**		**Normal Mould Ecology**		**Elevated**		**High**			**Very High**													

Elevated

Further investigation is warranted when mould spores + hyphae were detected on surfaces at concentrations greater than 500/cm^2 .

High

Where the total surface spore and hyphal concentration was above 1000/cm^2 active mould may have been present or cross contamination may have ocurred. The cause and source of the mould should be determined and redressed.

Very High

When the surface mould spore & hyphal concentrations exceed 5,000/cm^2 active mould was present on these surfaces and remediation to remove the mould growth is required.

The above results are discussed in the conclusions.

3.3 SURFACE SAMPLES

The results of the cultures to detect Coliforms/E. coli in the samples collected from the premises were tabulated as follows:

Sample No.	38 Black Street Brighton Vic 3186 Our Ref: 170542	COLIFORMS PRESENCE/ABSENCE	E.COLI PRESENCE/ABSENCE	COMMENT
15	Lounge Floor	POSITIVE	NEGATIVE	CAT 2
16	Hallway Floor	POSITIVE	NEGATIVE	CAT 2

The above results are discussed in the conclusions.

4 CONCLUSIONS

4.1 The levels of airborne mould detected in the samples collected from within the premises were rated as:

- samples 2, 3 and 4 – **Very High**[5]; and
- sample 5 – **High**[5] on microscopy.

4.2 It was noted that the mould concentration in the outside air sample was elevated.

4.3 Genera of mould were detected in the indoor air samples that were not detected in the outside air sample.

4.4 The levels of surface mould detected in the samples collected from within the premises were rated as:

- samples 10 and 14 – **Low**; and
- samples 12 and 13 – **Normal Mould Ecology**; and
- sample 7 – **Elevated**; and
- sample 9 – **High**; and
- samples 6, 8 and 11 – **Very High** on microscopy.

4.5 Coliforms were detected and E.coli were not detected in the samples received from within the premises and were rated as Cat 2.

4.6 Genera of mould were detected in samples 2, 3, 4, 5, 12, 13 and 14 that are known to be associated with wood rot.

4.7 Fungal hyphae were detected – the presence of fungal hyphae is indicative of recent active mould growth and therefore constitutes a potential health hazard; and

- high levels of fungal hyphae along with moderate levels of **active** fungal hyphae were detected in samples 6, 8, 9 and 11.

4.8 High to very very high levels of general dirt and debris were detected in majority of the samples and as a result the reported values above are estimates only.

4.9 With reference to the types and levels of mould detected in the samples submitted from within the above site, genera of mould were detected which include species which, as reported by References 1,3,5,7 have been shown to be either:

- Immuno-compromising; and/or
- Allergenic and/or
- Mycotoxin producers.

4.10 Therefore, based on the results of the samples submitted for analysis, the premises requires remediation by an accredited remediator, employing methods in accordance with Reference 2 or equivalent.

4.11 Following remediation, retesting to confirm post remediation verification should be performed in accordance with Reference 8.

For and on behalf of
NSJ EnviroSciences Pty Ltd
ABN 27 143 789 995
t/a MouldLab

DAVID LARK
Mycologist

REFERENCES:

1. "Microorganisms in home and indoor work environments. Diversity, health impacts, investigation & control." Flannigan, B, Samson, R. A & Miller, J. D. 2nd Edn. 2011. CRC Press, Boco Raton, London & New York.

2. "Standard for Professional Mold Remediation" IICRC s520 -2015, 3rd Edn Institute of Inspection, Cleaning & Restoration Certification, Vancouver, Washington 98661 USA.

3. "WHO Guidelines for Indoor Air Quality – Dampness and Mould", 2009 World Health Organisation, Copenhagen, Denmark,
ISBN 978 92 890 4168 3.

4. "Recognition, Evaluation & Control of Indoor Mold" Prezant, et al, AIHA, Fairfax VA USA, 2008, ISBN 193159492X.

5. "Worldwide Exposure Standards for Mold & Bacteria - Assessment Guidelines for Air, Water, Dust Ductwork, Carpet & Insulation", 8th Ed., 2010 – Robert C. & Gail M. Brandys, OEHCS, Inc. IL. ISBN 0-9774785-0-5

6. "HVAC Hygiene Guidelines, 2009" Australian Institute of Refrigeration, Air Conditioning & Heating.

7. "Food & Indoor Fungi" Samson, R.A et al CBS-KNAW Fungal Biodiversity Centre, Utrecht, The Netherlands ISBN 978 90 70351 82 3.

8. "Post-Remediation Testing and Verification for Mold and Bacteria" 4th Ed., 2011- Robert C. & Gail M. Brandys, OEHCS, Inc. IL. ISBN 978-0-9774785-1-4.

NSJ EnviroSciences Pty Ltd t/a MouldLab

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ANALYTICAL REPORT

CLIENT:	Biosafety Pty Ltd Unit 15, 69 Acacia Road Ferntree Gully VIC 3156
PROPERTY:	39 Black Street Brighton VIC 3186 Your ref: 20170019
PURPOSE OF THIS REPORT:	To detect mould present by Polymerase Chain Reaction (PCR) analysis of fungal DNA and determine relative mould species in the samples taken from within the premises (progress). Provide an **Environmental Relative Mouldiness Index (ERMI)** calculated on the basis of the mould species detected and evaluate the ERMI as an index of the severity of the mould present within the premises where sampling was conducted.
DATE OF SAMPLING:	4 May 2017
SAMPLED BY:	Brett Cole
DATE SAMPLE/S RECEIVED:	5 May 2017
DATE OF REPORT:	12 May 2017
PREPARED BY:	Jill Lark (CD)
REPORTED AND RELEASED BY:	David Lark Mycologist
OUR REFERENCE:	171251 - ERMI

AIHA Environmental Microbiology Proficient
EMPAT Proficient Lab. No: 208121

ANALYTICAL REPORT

1 INSTRUCTIONS

1.1 The samples collected at the property were submitted by Brett Cole.

1.2 The purpose of the samples submitted for analysis was to detect and report on mould present using PCR detection methods as set out in the attached report and interpret these findings (progress).

2 COMMENTARY

2.1 The samples collected were referred under chain of custody to our laboratory for analysis and reporting.

2.2 The samples received were labelled and in an intact condition.

2.3 This is an Analytical Report only and may not be in a format acceptable for litigation purposes because different Jurisdictions have differing requirements. Please contact MouldLab for further assistance.

2.4 Unless MouldLab has either performed the assessment from which this sample emanates or has been provided with the requisite certification from the sampler as per Reference 8, the results contained in this report should not be relied upon as the sole criteria for granting "clearance" or post remediation verification by any party.

2.5 In accordance with our Terms & Conditions this document and its contents are intended for the Addressee only and contains opinions held by the Author who prepared this report based on material available at the time of preparation and expressed for the purposes of consideration by the Addressee and is not for general publication without written consent.

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3 RESULTS

3.1 PCR MOULD ANALYSIS

The result of the mould detected in the cloth samples collected from the property were tabulated as shown in the following table, together with the interpretation of the data.

Sample 1:

Group 1; Water Damage Moulds

	SE	SE/mg	Logs 10
Aspergillus flavus	7	1	
Aspergillus fumigatus	39	8	0.9
Aspergillus niger	55	11	1.0
Aspergillus ochraceus	561	110	2.0
Aspergillus penicillioides	420	82	1.9
Aspergillus restrictus	2,494	489	2.7
Aspergillus sclerotiorum	ND	ND	
Aspergillus sydowii	7	1	
Aspergillus unguis	22	4	0.6
Aspergillus versicolor	4,310	845	2.9
Aureobasidium pullulans	6,839	1,341	3.1
Chaetomium globosum	7	1	
Cladosporium sphaerospermum	193,731	37,986	4.6
Eurotium amstelodami	6,180	1,212	3.1
Paecilomyces variotii	1	1	
Penicillium brevicompactum	26,864	5,267	3.7
Penicillium corylophilum	13,323	2,612	3.4
Penicillium crustosum	642	126	2.1
Penicillium purpurogenum	104	20	1.3
Penicliium spinulosum	3,411	669	2.8
Penicillium variabile	70	14	1.1
Scopulariopsis brevicaulis/fusca	2	1	
Scopulariopsis chartarum	70	14	1.1
Stachybotrys chartarum	3,994	783	2.9
Trichoderma viride	1,669	327	2.5
Wallemia sebi	506	99	2.0
Sum of Logs		**46.0**	

Group 2; Common Indoor Moulds

	SE	SE/mg	Logs 10
Acremonium strictum	209	41	1.6
Alternaria alternata	44	9	0.9
Aspergillus ustus	241	47	1.7
Cladosporium cladosporioides 1	1,642	322	2.5
Cladosporium cladosporioides 2	53,878	10,564	4.0
Cladosporium herbarum	674	132	2.1
Epicoccum nigrum	461	90	2.0
Mucor amphibiorum	113	22	1.3
Penicillium chrysogenum	4,480	878	2.9
Rhizopus stolonifer	1	1	0.0
Sum of Logs		**19.1**	

Sample I.D	171251-1
Sample weight (mg)	5.1
ERMI Results= (G1-G2)	**26.8**

SE* =Spore Equivalents
ND= Non Detected

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Sample 2:

Group 1; Water Damage Moulds

	SE	SE/mg	Logs 10
Aspergillus flavus	7	1	
Aspergillus fumigatus	7	1	
Aspergillus niger	8	1	
Aspergillus ochraceus	ND	ND	
Aspergillus penicillioides	28	6	0.8
Aspergillus restrictus	16	3	0.5
Aspergillus sclerotiorum	ND	ND	
Aspergillus sydowii	ND	ND	
Aspergillus unguis	ND	ND	
Aspergillus versicolor	112	23	1.4
Aureobasidium pullulans	15,545	3,172	3.5
Chaetomium globosum	2	1	
Cladosporium sphaerospermum	7,099	1,449	3.2
Eurotium amstelodami	4,212	860	2.9
Paecilomyces variotii	3	1	
Penicillium brevicompactum	14,006	2,858	3.5
Penicillium corylophilum	8,993	1,835	3.3
Penicillium crustosum	317	65	1.8
Penicillium purpurogenum	7	1	
Penicliium spinulosum	1,452	296	2.5
Penicillium variabile	7	1	
Scopulariopsis brevicaulis/fusca	5	1	
Scopulariopsis chartarum	10	2	0.3
Stachybotrys chartarum	917	187	2.3
Trichoderma viride	30	6	0.8
Wallemia sebi	4	1	
Sum of Logs		**26.6**	

Group 2; Common Indoor Moulds

	SE	SE/mg	Logs 10
Acremonium strictum	285	58	1.8
Alternaria alternata	77	16	1.2
Aspergillus ustus	8	1	0.0
Cladosporium cladosporioides 1	1,424	291	2.5
Cladosporium cladosporioides 2	5,352	1,092	3.0
Cladosporium herbarum	641	131	2.1
Epicoccum nigrum	1,147	234	2.4
Mucor amphibiorum	2	1	0.0
Penicillium chrysogenum	2,572	525	2.7
Rhizopus stolonifer	ND	ND	
Sum of Logs		**15.7**	

Sample I.D	171251-2
Sample weight (mg)	4.9
ERMI Results= (G1-G2)	**10.9**

SE* =Spore Equivalents
ND= Non Detected

4 CONCLUSIONS

4.1 The ERMIs were found to be:-

Sample No:	Sample Location	Environmental Relative Mouldiness Index (ERMI)	Interpretation
171251-1	Downstairs	26.8	Q4
171251-2	Upstairs	10.9	Q4

4.2 Interpretation was made with reference to the following table:-

Level	ERMI Value	Interpretation	Comment
Q1	Less than -4	Low Relative Mouldiness	Further investigation is not needed to determine the sources of the mould.
Q2	-4 to 0	Low- Medium Relative Mouldiness	Further investigation may be needed to determine the sources of the mould if occupants have been reactive, sensitised, genetically predisposed or otherwise immuno-compromised
Q3	0 to 5	Medium- High Relative Mouldiness	
Q4	>5 to 20	High Relative Mouldiness	Source and cause of mould should be determined and remediation undertaken, reducing the ERMI to levels below Q2
	>20	Very High Relative Mouldiness	

4.3 According to Vesper[9] ERMI Scores have a SD of +/-3 and should be assessed with this in mind.

4.4 Further assessment was performed by calculating the HERTSMI-2 score from this data, it was found to be:-

Sample 1:

Site Address: **39 Black Street** **Brighton VIC 3186** **Our ref: 171251**	**Sample Location:** **Downstairs**	
Fungal ID \ Sample ID:	**171251-1**	
Sample type: cloth	**Spore E./mg**	**Weighting**
Aspergillus penicillioides	82	4
Aspergillus versicolor	845	10
Chaetomium globosum	1	0
Stachybotrys chartarum	783	10
Wallemia sebi	99	0
HERTSMI-2 SCORE		**24**

Sample 2:

Site Address: **39 Black Street** **Brighton VIC 3186** **Our ref: 171251**	**Sample Location:** **Upstairs**	
Fungal ID \ Sample ID:	**171251-2**	
Sample type: cloth	**Spore E./mg**	**Weighting**
Aspergillus penicillioides	6	0
Aspergillus versicolor	23	4
Chaetomium globosum	1	0
Stachybotrys chartarum	187	10
Wallemia sebi	1	0
HERTSMI-2 SCORE		**14**

4.5 HERTSMI-2 scores between 11 and 15 have been associated with re-occurance of CIRS-WDB symptoms. Further assessment is suggested to determine the cause and extent of the mould contamination, then remediation and retesting is recommended.

4.6 HERTSMI-2 scores of >15 have been associated with re-occurance of CIRS-WDB symptoms on more than 99% of occasions as shown in Reference 10.

4.7 A spore equivalent may reflect the presence of any other fungal structures (i.e. mycelia) containing the same number of target genes as a spore.

4.8 Genetically closed-related species may be detected in the indicator assay:

As reported	Includes
Eurotium (Asp.) amstelodami	*E. chevalieri, E. herbariorum, E. rubrum and E. repens;*
Penicillium spinulosum	*P. glabrum, P. lividum, P. pupurescens, and P. thomii*
Trichoderma viride	*T. koningii and T. atroviride.*
Aspergillus restrictus	*A. caesillus and A. conicus.*
Mucor amphibiorum	*M. circinelloides, M. hiemalis, M. indicus, M. mucedo, M. racemosus, M. ramosissimus*
Rhizopus zygosporus	*R. homothalicus, R. microsporus, R. oligosporus, R. oryzae*
Penicillium crustosum	*P. camembertii, P. commune, P. echinulatum, P. solitum*

For and on behalf of
NSJ EnviroSciences Pty Ltd
ABN 27 143 789 995
t/a MouldLab

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REFERENCES:

1. "Microorganisms in home and indoor work environments. Diversity, health impacts, investigation & control." Flannigan, B, Samson, R. A & Miller, J. D. 2nd Edn. 2011. CRC Press, Boco Raton, London & New York.

2. "Standard & Reference Guide for Professional Mold Remediation" IICRC s520 – Aug. 2008, 2nd Ed. Institute of Inspection, Cleaning & Restoration Certification, Vancouver, Washington 98661 USA.

3. "WHO Guidelines for Indoor Air Quality – Dampness and Mould", 2009 World Health Organisation, Copenhagen, Denmark, ISBN 978 92 890 4168 3.

4. "Australian Mould Guideline (AMG 2010)". Kemp, P.C et al. 2nd Edn. 2010 Messenger Publishing.

5. "Worldwide Exposure Standards for Mold & Bacteria - Assessment Guidelines for Air, Water, Dust Ductwork, Carpet & Insulation", 8th Ed., 2010 – Robert C. & Gail M. Brandys, OEHCS, Inc. IL. ISBN 0-9774785-0-5

6. "HVAC Hygiene Guidelines, 2009" Australian Institute of Refrigeration, Air Conditioning & Heating.

7. "Food & Indoor Fungi" Samson, R.A et al CBS-KNAW Fungal Biodiversity Centre, Utrecht, The Netherlands ISBN 978 90 70351 82 3.

8. "Post-Remediation Testing and Verification for Mold and Bacteria" 4th Ed., 2011-Robert C. & Gail M. Brandys, OEHCS, Inc. IL. ISBN 978-0-9774785-1-4.

9. "Development of a Environmental Relative Mouldiness Index" Vesper S. *et al,* Occupational Env. Med, 49, 829 – 833.

10. Shoemaker, RC and Lark, D - 2016, HERTSMI-2 and ERMI: Correlating Human Health Risk with Mold Specific qPCR in Water-Damaged Buildings, in Proceedings of the 14th International Conference on Indoor Air Quality and Climate, International Society for Indoor Air Quality and Climate, Ghent, Belguim, #658