**Procedure Title**: Bacterial Testing of Cooling Towers Procedure  

**Parent Policy**: OHS Policy  

**Date Effective**: May 2017  

**Review Date**: May 2020  

**Procedure Owner**: Manager, OH&S  

**Category**: Operational  

**Version Number**: 5.1  

**Content Enquiries**: Bernadette.Hayman@monash.edu  

**Scope**: This procedure applies to all buildings owned and/or under the control of Monash University within Australia. Instances whereby buildings fall outside the scope of this procedure should be referred to Monash Occupational Health & Safety (OH&S) for consideration.  

**Purpose**: This procedure set out the requirements for the treatment and notification of Legionella bacteria and elevated bacterial levels in cooling tower water and confirmed cases of Legionnaires disease at Monash University.  

**Contents**  

1. Abbreviations .................................................................................................................. 2  
2. Definitions .......................................................................................................................... 2  
3. Notification Procedures ..................................................................................................... 3  
   3.1. Prescribed Action Levels for Bacterial/Legionella Testing of Cooling Tower Water .... 3  
   3.2. Confirmed Case(s) of Legionnaires Disease .................................................................. 4  
4. Responsibility for Implementation .................................................................................... 5  
5. Records .............................................................................................................................. 5  
6. Document History ............................................................................................................. 7
1. Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFU/mL</td>
<td>Colony forming unit per millilitre of sample</td>
</tr>
<tr>
<td>DHHS</td>
<td>Department of Health and Human Services</td>
</tr>
<tr>
<td>BPD</td>
<td>Buildings and Property Division</td>
</tr>
<tr>
<td>OHS</td>
<td>Occupational Health and Safety</td>
</tr>
<tr>
<td>OH&amp;S</td>
<td>Monash Occupational Health &amp; Safety</td>
</tr>
<tr>
<td>M&amp;MW</td>
<td>Maintenance and Minor Works</td>
</tr>
<tr>
<td>TBC/HCC</td>
<td>Total bacteria count/heterotrophic colony count</td>
</tr>
</tbody>
</table>

2. Definitions

A comprehensive list of definitions is provided in the Definitions tool. Definitions specific to this procedure are provided below.

**Total Bacteria Count/Heterotrophic Colony Count**: Heterotrophic colony count is an estimate of the number of viable units of bacteria per millilitre of water made using the pour plate, spread plate or membrane filter test. It is used as an indicator of water quality in cooling water systems. HCC is also known as total bacteria count (TBC), total plate count or viable bacteria count test. It is reported as the number of colony forming units per millilitre of sample (CFU/mL).

For the remainder of these procedures, bacteria levels will be referred to as HCC.
3. Notification Procedures

3.1. Prescribed Action Levels for Bacterial/Legionella Testing of Cooling Tower Water

 Cooling Tower Testing and Notification Procedure

Routine Monthly Testing:
- Routine Monitoring
  - Yes
  - Is this the 3rd consecutive treat and test?
    - Yes
    - Results within acceptable range
    - Treat and retest
    - Results within acceptable range
    - No
    - No
    - No
    - No
    - Yes
    - Results within acceptable range
    - No
    - Yes
    - Notify Chief Operating Officer (x29897)
    - Global Email Advice
    - Isolate Cooling Tower
  - No

Retesting:
- Results within acceptable range
  - Yes
  - No

Notification:
- OH&S (x51016)
- Chef Medical Officer (x51165)
- Executive Director Buildings and Property (x20365)
- DHHS 1300 767 469
3.2. Confirmed Case(s) of Legionnaires Disease

Notification Procedure in Confirmed Case(s) of Legionnaires Disease

- **Notification of Confirmed Case(s)**
  - Monash University Notified of Confirmed Case(s)
  - Chief Medical Officer (X51166)

- **Internal Notifications**
  - Manager OH&S (X50166)
  - Chief Operating Officer (X29897)
  - Global Email Advice

- **Notification within affected area**
  - Dean or Divisional Director
  - Occupational Health Team (X51014)
  - Area OHS Consultant
  - Area Safety Officer
  - Area HSR

- **Testing**
  - Undertake immediate testing of all suspect towers.
  - Reporting in accordance with Testing and Notification Procedures.

- **External Notifications**
  - Executive Director Buildings and Property Division (X20369)
  - Relevant BPD Staff
  - Contractors

For the latest version of this document please go to: http://www.monash.edu.au/ohs/
4. Responsibility for Implementation

A comprehensive list of OHS responsibilities is provided in the OHS roles, committees and responsibilities procedure. A summary of the specific responsibilities with respect to bacterial testing of cooling towers is provided below.

**Services (Building Maintenance)**

Building maintenance staff must:

- Manage the testing of HCC in the cooling tower water in order to detect the levels of Legionella species and HCC;
- Notify Monash Occupational Health & Safety (OH&S) if:
  - 3 consecutive detections of Legionella species (≥10CFU/mL); or
  - 3 consecutive elevated HCC (≥100,000CFU/mL) are detected in cooling tower water (from the same tower);
- Advise OH&S of the need to re-test cooling tower/s water following notification from the Department of Health and Human Services (DHHS) of confirmed case/s of Legionnaires disease.

**Monash Occupational Health & Safety (OH&S)**

OH&S must:

- When notified by Services staff of Legionella detection and/or elevated HCC in cooling tower water, communicate with all relevant parties within the university as detailed in these procedures;
- When notified by Services staff of three consecutive detections of Legionella species (≥10CFU/mL), communicate with DHHS, as detailed in these procedures;
- Send notification reports of three consecutive detections of Legionella bacteria in cooling tower water to DHHS;
- When notified by DHHS of confirmed case(s) of Legionnaires disease, communicate with the relevant department, and Dean of faculty, if multiple cases are reported;
- Update these notification procedures, as required.

5. Records

For OHS Records document retention please refer to:

<table>
<thead>
<tr>
<th>Status</th>
<th>Revised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval Body</td>
<td>Monash University OHS Committee</td>
</tr>
</tbody>
</table>
Public Health and Wellbeing Regulations 2009  
Building (Legionella Risk Management) Regulations 2001  
Health Act 1958  
Health (Legionella) Regulations 2001  
Occupational Health and Safety Act 2004  
Occupational Health and Safety Regulations 2017  |
| Related Policies | OHS Policy                    |
| Related Documents | Australian Standards          |
|                 | • AS/NZS 2243.1: 2005 Safety in Laboratories Part 1 - Planning and operational aspects  
• 2243.2: 2006 Safety in Laboratories Part 2 - Chemical aspects  
• AS/NZS 3666 Air-handling and water systems of buildings - Microbial Growth  
• 3666.1: 2011 Design, installation and commissioning  
• 3666.2: 2011 Operation and maintenance  
• 3666.3: 2011 Performance-based maintenance of cooling water systems  
• AS/NZS 4276.1: 2007 Water microbiology - General information and procedures  
• AS/NZS 3896: 2008 Waters-Examination for legionellae including Legionella pneumophila  
• AS/NZS 2031.2: 2001 Selection of containers and preservation of water samples for microbiological analysis |
|                 | Monash University OHS Documents |
|                 | Legionella and cooling towers OHS information sheet  
Risk management of cooling towers OHS information sheet  |
|                 | Other Documents                |
Template for cooling tower system Risk Management Plans, Public Health Division, Department of Health and Human Services, Victoria, 2015  |
### 6. Document History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date of Issue</th>
<th>Changes made to document</th>
</tr>
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<tbody>
<tr>
<td>3</td>
<td>April 2009</td>
<td>Notification procedures for prescribed action levels for bacterial/legionella testing of cooling tower water, and confirmed case/s of Legionella Disease, v3</td>
</tr>
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</table>
| 4       | June 2014     | 1. Changed title to Bacterial Testing of Cooling Towers Procedure  
2. Added link to definitions document  
3. Updated responsibilities section to name maintenance and minor work as the responsible section of FSD for testing.  
4. Added tools associated with this document. |
| 4.1     | May 2016      | 1. Updated flowchart with contact details  
2. Changed names to reflect changes in organisational structure |
| 5       | May 2017      | 1. Updated to reflect changed organisational structure in Buildings and Property Division  
2. Updated flowchart to clarify triggering of additional actions after 3rd positive test.  
3. Updated Records, Compliance and References sections |
| 5.1     | August 2017   | 1. Updated logos in header  
2. Updated OHS Regulations to 2017 |