World Plumbing Conference – Effective Water Risk Management, A Different Perspective

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We are specialists in...

- Legionella Management
- Drinking/ Potable Water Management
- Recycled / Wastewater Management
- Water Quality Risk Assessment & Incident Management
- Water Quality / Legionella Compliance
- Exposure Risk Assessment
- Assessment of Health Based Targets (HBTS)
- CSSD Compliance
- Water Efficiency

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Presentation Agenda and Objectives

Water Risk Management – A Different Perspective

Presentation Agenda:

• Background – A Risk that Cannot be Ignored
  Changing Landscape
  A Plumbers Understanding of Water Hygiene
• Typical Challenges and Examples
• Looking Forward - What Does Good Look Like
• Questions
FURY OVER SECOND STORMWATER BUNGLE

Another recycled water blunder saw a Paralowie woman drink and bathe in recycled water, prompting calls for a statewide audit.
The main objectives of controlling water quality within distribution systems include:

1. **Protection of public health** (safety). i.e. complying with health guidelines
2. **Consumer satisfaction** i.e. complying with aesthetic guidelines
3. **Infrastructure / Maintenance Considerations** i.e. corrosive or scaling waters
Factors That Influence Water Quality

Setting The Scene – Water Quality

There are four main categories of quality-influencing factors:

- Microbiological species (greatest risk)
- Chemical compounds – inorganic and organic
- Physical/aesthetic factors affecting acceptability
- Radioactive species

Exposure to pathogens can be from systems other than drinking water - Water quality needs to be fit for purpose – fit for intended end use

What is a typical plumber’s understanding of water hygiene?
Pathogens are micro-organisms that can cause disease.

Pathogens of particular concern include:
- Protozoa
- Bacteria
- Viruses
Setting The Scene – Water Quality

Aesthetic Awareness

Typical aesthetic issues include:
- Colour
- Taste
- Odour
- Feel

Australian Drinking Water Guidelines (ADWG) has aesthetic guideline values.

Should we investigate aesthetic concerns?
Typical Water Risk Management Challenges – Plumbing Perspective

The top 5 risks associated with the supply of water from a plumbing and potential public health perspective include:

1. **Complacency** ("We have never had anybody get sick from our drinking water" / "We never detect any E.coli")
2. **Lack of awareness and understanding** of potential pathogens (raw and treated water) and impact of actions to water quality
3. **Lack of awareness / inadequate management of disinfection residuals** (barrier to end points / point of use)
4. **Insufficient preparedness** for adverse water quality incidents (e.g. bursts and repairs)
5. **Inadequately updated** Management Plans and supporting procedures.

Awareness is key to mitigating the above risks
Typical Water Risk Management Challenges – Plumbing Perspective

In general (based on our audits and evaluations) licenced **plumbers are not routinely set up to succeed**. Other challenges include:

- **General lack of awareness and understanding of applicable Water Quality Guidelines** (typically focused only on plumbing code)
- **Not trained or aware of sample collection protocols / requirements** (e.g. AS 2031 or AS 5667)
- **Ill equipped to interpret water quality results or understand their significance**
- **Corrective actions are often delayed or not performed effectively** (e.g. super-chlorination, chlorine contact times and neutralisation)
- **System commissioning challenges** (requirements, effectiveness, timeframes, impacts to water quality)
- **Lack of understanding of the importance of operational monitoring results** (lead vs lag indicators)
- **Lack of awareness of importance of effective record keeping**

1. Other?
Challenges – Examples - Training & Awareness
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Screening on the WST overflow
Challenges – Examples – Training & Awareness
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Challenges – Examples – Training & Awareness
School drinking fountain connected to recycled water

April 14, 2013

Almost every school has a drinking fountain that no student dare touch.

That's now certainly the case at St. Peters College’s Cranbourne East campus, where students have been unknowingly drinking from a fountain connected to recycled water from a sewage treatment plant for more than a year.

The fountain’s water supply was disconnected on April 1 after a thirsty maintenance worker drank from the bubbler and noticed the water didn’t taste right.

Authorities were alerted and discovered that recycled water from the Eastern Treatment Plant was connected to the fountain. The incident is now being investigated by the Victorian Building Authority.

Investigation of the potable water contamination incident at Ranger mine

March 2004

Supervising Scientist

Australian Government
Department of the Environment and Heritage
Supervising Scientist
The delivery of safe, good quality, and reliable water (fit for purpose) requires:

- **Understanding water quality risks to consumers/users** (awareness)
- **Implementing barriers** to control those risks
- **Monitoring and response** to ensure continuous barrier operation
- **Understanding legal and duty of care obligations.**
Effective Water Quality Management – It’s a Journey

Where Are You on the Journey?

- Awareness of gap in water quality management
- Undertake risk assessment
- Development of water quality management plan / water safety plan and supporting procedures and protocols
- Embedding and implementation of improvement plan
- Implementation and continuous improvement of water quality management and improvement actions
Role of Training in Unlocking The Water Quality Risk Management Journey

ADKAR Model of Change

A  Awareness: of the need to change
D  Desire: to support and take part in the change
K  Knowledge: of how to change
A  Ability: to implement the change
R  Reinforcement: to sustain the change
Role of Training in Unlocking The Water Risk Management Journey

The key objectives of the water quality awareness training are to:

1. Empower Licensed Plumbers to perform their duties in relation to water quality **with more confidence and competence**
2. Improve public health outcomes by focussing on key water quality risks
3. Contribute towards a plumbers **Continuous Professional Development**
4. Inform plumbers of the **latest guidelines and standards**
What Does Good Look Like – Awareness & Training

Adequate awareness, training and the provision of relevant information is recognised as essential ‘duty of care’. Using a risk-based approach water hygiene awareness training is central for all plumbers with special consideration given to:

• Health Care facilities
• Aged Care facilities
• Remote locations
• Self-managed water systems (plumbers operating water treatment equipment)
• All other systems.
## What Does Good Look Like – Awareness & Training

<table>
<thead>
<tr>
<th>Role</th>
<th>Recommended Minimum Qualification Requirements</th>
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</thead>
<tbody>
<tr>
<td>Key Personnel(^1) Involved in the Operation, Management and Maintenance of Drinking Water Systems</td>
<td>Drinking Water Quality Awareness Training(^1)</td>
</tr>
<tr>
<td>Drinking Water Quality Samplers</td>
<td>Appropriate water sampling and monitoring(^1)</td>
</tr>
<tr>
<td>Drinking Water Treatment Plant Operator</td>
<td>Certificate III in Water Operations(^4)</td>
</tr>
<tr>
<td>Drinking Water Treatment Plant Supervisors</td>
<td>Relevant Industry Experience(^2)</td>
</tr>
<tr>
<td></td>
<td>Drinking Water Quality Event Response Training</td>
</tr>
</tbody>
</table>

\(^1\)For personnel that do not have a Certificate III in Water Operations
\(^2\)Once appointed supervisors will be required to obtain their Certificate III in Water Operations
\(^3\)Key personnel includes supervisors, superintendents and management level personnel whose accountabilities include operation, maintenance and / or management of a component of the drinking water system
\(^4\)Existing operators will be provided with a reasonable time and assistance to complete their Certificate III in Water Operations
What Does Good Look Like – Effective Record Keeping & Working Smarter

- Starts with awareness of key data. Records such as operational data (such as flushing records, free residual chlorine, temperature – efficacy of barriers and effectiveness of remedials)
- Use of software such as Compliance Tool
- Drives the implementation of the plan and associated program / protocols
- Provides central repository for all water quality related records
- Provides foundation for sound risk based decision making (all the pieces of the puzzle)
- Drives accountability / full transparency (proof of presence, task completion and performance)
What Does Good Look Like – Effective Record Keeping & Working Smarter

LIVE DASHBOARD AVAILABLE
24/7 – Performance per Hydraulic Zone

Automated Reporting

DATA TRENDING ALLOWS FOR ANALYSIS AND INFORMED DECISION MAKING

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What Does Good Look Like - Incident Response Protocols (IRP)

- The IRP should be pre-determined and cover all possible scenarios.
- Personnel to be aware of IRP’s.
- Should be as prescriptive as possible.
- Should include an outline of all nominated roles and responsibilities.
- Should include details surrounding the need for internal/external reporting.
- Should include timeframes/actions for closing out the incident.
Looking Forward - Key Considerations

The Landscape continues to Change in Water Quality Risk Management. The following merits further consideration:

- Plumbers have the potential to directly impact public health and hence need to be better informed so that aware of this potential to impact public health
- Use a risk based approach to close the water hygiene awareness / training gap endemic within plumbers (start with high risk facilities) both at plumber training and operational level
- Consideration of ‘minimum water hygiene awareness’ training requirements for high risk facilities
- How plumbing community intend to practically respond to the need for increased accountability?
ANY QUESTIONS?

Thank You for Your Time