

Meeting:	Employees Consultative Forum
Date:	28 January 2009
Subject:	The Arrangements for Managing and Monitoring Legionella.
Key Decision:	No
Responsible Officer:	Myfanwy Barrett – Corporate Director Finance
Portfolio Holder:	Councillor David Ashton – Leader encompassing Strategy, Partnership and Finance
Exempt:	No
Enclosures:	Appendix 1 Water Monitoring Procedure Notes Appendix 2 Policy For Harrow Council. Control of Legionella Bacteria in Water Systems Appendix 3 HSCOP 09-00: Health and Safety Code of Practice on Legionella Risk Assessment and Control

Section 1 – Summary and Recommendations

This information report sets out The Arrangements for Managing and Monitoring Legionella at Harrow Council.

Recommendations:

For Information.

Section 2 – Report

The arrangements for monitoring legionella at Harrow Council are set out at appendix 1. The arrangements for managing legionella are set out in the Councils policy and code of practice, which are attached as appendix 2 and 3.

Background

Biological hazards

Legionella is classed as a biological hazard which broadly encompasses those hazards related to workers' exposure to biological agents at work. 'Biological agents' refer to microorganisms (bacteria, viruses and fungi) including genetically modified ones, cell cultures and human endoparasites which may be able to cause infection, allergy or toxicity. Biohazards are of particular significance in biological research or experimentation eg in clinical microbiology labs. A biohazard presents a risk or potential risk to the health of humans or other animals, either directly through infection or indirectly through damage to the environment.

In some occupations and business activities, hazards posed by microorganisms present a risk to employees and the community at large, as is often the case with Legionnaires disease. However, for the vast majority of businesses the biohazard risk is only marginally more significant than that faced by the general population, while for others specialist risk assessment is necessary.

Legionnaires disease

Legionellosis is the general term used to describe all forms of infection caused by bacteria of the genus legionella, of which the most severe form is Legionnaires disease. Well-publicised examples of legionellosis this year include an outbreak on the Black Watch cruise liner, which affected seven elderly people; 80 prisoners who were evacuated from a Kent jail as a precautionary measure; and an outbreak at a Sunderland health club, which affected up to 115 people with legionellosis-like symptoms and the more recent Barrow in Furness case.

Legionellae occur naturally in low numbers in the aquatic environment – lakes, rivers, surface and ground waters, and, since mains water is derived from these sources, it can be a source of contamination in the built environment, providing favourable conditions in which legionellae can grow rapidly.

Legionnaires disease develops in a relatively small proportion of those people exposed to legionellae, and the incubation period is usually about 2-10 days, but can be up to 16 days. Symptoms begin abruptly, ranging from a mild cough and fever to, in more severe cases, stupor, respiratory difficulty and multi-organ failure.

The infection process

To cause infection, legionellae bacteria need to be inhaled. The inhaled particles must be small enough to penetrate down to the deepest part of the lungs, but large enough to contain at least one bacterial cell. A suspension of such particles in air is termed an aerosol, and may not necessarily be visible, or even wet.

It is a common misconception that a water spray is an aerosol, and that legionellae have to be contained within a wet droplet. A mist of water droplets may constitute an aerosol if the droplets are small enough, but water evaporates from small droplets very quickly.

If a water droplet contains a single bacterial cell, the droplet will evaporate to a particle-size diameter, or droplet nucleus, of about 1 μm .² A particle of this size can remain suspended in air for prolonged periods of time, and travel considerable distances. They are dry, and contain no moisture, so when air is inhaled, about 50 per cent of the particles are retained in the lungs.

Water systems that produce aerosols represent the highest levels of risk. Aerosols can be generated very easily when the water surface is broken – for example, by falling water droplets, splashing, or by bubbles breaking at the surface.

Legal Requirements

There are two main pieces of legislation that impact on biohazards in the workplace RIDDOR and COSHH:

RIDDOR

Schedule 3 of the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) lists the specific infections caused by biological agents which are reportable when connected with work.

COSHH

The HSE publishes a classification of biological agents and this Approved List is made under Section 15 of the Health and Safety at Work etc Act 1974. The Control of Substances Hazardous to Health Regulations 2002 (COSHH) make reference to this list. The List implements the Community Classification of biological agents set out in European Community Directive 2000/54/EC. The Approved List of biological agents should be read in conjunction with COSHH 2002 and, in particular, Schedule 3 – ‘Additional provisions relating to work with biological agents’. Agents appearing in the Approved List are classified on the basis of their ability to cause disease by infection. Only agents in Groups 2, 3 and 4 are listed. Those not listed in these groups are not implicitly classified in Group 1. In allocating biological agents to a hazard group, no account is taken of individual susceptibility to infection and any additional risks to such employees should be considered as part of the general risk assessment required by COSHH.

The COSHH Regulations 2002 are relevant to biohazards in the workplace as these regulations include biological agents such as bacteria and other microorganisms in the definition of substances that are hazardous to health, if they are directly connected with work or if the exposure is incidental to the work (eg exposure to bacteria from an air-conditioning system that is not properly maintained). As a result, if biological hazards are present in the workplace then risk assessments need to be undertaken.

The Regulations also specifically require notification of use and consignment of biological agents to the HSE.

Section 6 - Contact Details and Background Papers

Contact: Paul Williams, Occupational Health and Safety Service Manager,
020 8424 1362

Background Papers:

Appendix 1: Water monitoring procedure outline of duties

Appendix 2: HSCOP 09-00: Health and Safety Code of Practice on Legionella Risk Assessment and Control.

Appendix 3: Policy For Harrow Council on the Control of Legionella Bacteria in Water Systems

APPENDIX 1

WATER MONITORING PROCEDURE

OUTLINE OF DUTIES

1. Arriving at the Civic in the morning at 8am.
2. Individual sites' monitoring sheets issued by area.
3. Go to the sites.
4. Taking temperature readings at the locations specified.
5. Accurately recording all readings and leaving a copy of the sheet onsite for their reference. Original copy to be brought back to the Civic.
6. Observing for any other changes/improvements/alterations, etc.
7. Return back to Civic
8. Report on any adverse temperatures and other conditions to engineers.
9. Monthly monitoring sheets to be filed in water monitoring site folders in Room L28.
10. Engineers to initiate remedial orders to rectify adverse results if and when identified.
11. Ashok to monitor as and when remedials are completed.

MONITORING OF SHOWERHEAD CLEANING AND DESCALING CARRIED OUT BY KIER BUILDING MAINTENANCE

1. A contract is in place with Kier Building Maintenance to carry out quarterly showerhead cleaning and descaling at all sites with showerheads.
2. Reports received following showerhead cleaning and descaling are checked and if any remedials identified, orders are placed to Kier. Reports are then filed in the appropriate folders.
3. When carrying out water temperature checks, showerheads are monitored at the same time.
4. If noticed that showerheads need descaling, an order is issued to Kier for a descale to be carried.

APPENDIX 2

HARROW COUNCIL

Control of Legionella Bacteria in Water Systems

Policy

For

Harrow Council.

ISSUE NO	HSP 03-00
DATE	February 2006
REVIEW DATE	30/01/08

Introduction

Legionellosis is a group of diseases, which includes legionnaires' disease. The potentially fatal infection has symptoms similar to flu and pneumonia. *Legionella pneumophila*, the bacteria responsible for legionnaires' disease, exist naturally in external watercourses, and can easily contaminate and grow in other water systems such as air-conditioning, cooling towers and hot and cold water systems in buildings. In favourable conditions, bacteria can multiply to critical levels in stored water. Legionnaires' disease is caused when water droplets containing the bacteria are inhaled.

This policy applies to the control of *legionella* bacteria in water systems in Harrow Council properties.

Policy Statement

Health and safety law requires Harrow Council to consider the risks from *legionella* that may affect our staff, tenants and members of the public.

Harrow Council is committed to preventing and managing the risks arising from *legionella* bacteria in water systems and will ensure that:

- suitable and sufficient assessments are undertaken of water systems and work activities to determine the risks arising from *legionella* bacteria and:
 - Avoid significant risks so far as is reasonably practicable, or
 - Develop written schemes to prevent or control significant risks which cannot be avoided.
- a competent "Responsible Person" is appointed to be managerially responsible for the management and implementation of the scheme of control.
- the commissioning of any new plant or equipment involving water systems adequately addresses, avoids or reduces the potential risks from *legionella* bacteria.
- risk assessments are reviewed every 2 years or sooner if there has been any change to the water system or its use.
- monitoring arrangements are established to ensure that any precautions taken to avoid or reduce the risks remain effective.
- suitable records are kept and retained as follows:
 - Risk Assessments for 2 years
 - Written schemes of control for 2 years
 - Documents relating to monitoring, inspection, testing and checking for 5 years

Responsibilities

Executive Directors are responsible for ensuring that:

- procedures are in place within the premises managed by their Directorate to implement the requirements of this corporate policy;
- adequate resources are available to allow those with responsibilities with respect to the control of *legionella* bacteria to discharge their duties.

Group Managers are responsible for ensuring that:

- the Directorate procedures for controlling *legionella* bacteria are implemented;
- managers and employees nominated as a “Responsible Person” within the meaning of the regulations, are identified in the relevant Group Health and Safety Plans;
- the necessary resources (including appropriate instruction and training) are available to those who have been assigned duties and responsibilities with respect to the identification and control of *legionella* bacteria.

Premises Managers and other employees who have been assigned responsibilities for the implementation of procedures to identify and control the risks from *legionella* bacteria in Council premises, will be identified in the Executive Directorate Health and Safety Policy and Group Health and Safety Plans. These members of staff have a duty to:

- discharge their assigned responsibilities
- raise with their line manager or supervisor, any concerns they have with respect to the procedures in place to control the risk from *legionella* bacteria.

Monitoring and Review

The Health and Safety Service will be responsible for reviewing this policy and ensuring that it is in line with current legislation and best practice.

The Health and Safety Service will monitor compliance with this policy corporately.

Each Directorate will instigate a system to monitor compliance with the policy in the management, installation, commissioning, repair, maintenance or decommissioning of water systems within the Council premises managed by the Directorate.

Signed by:

Chief Executive:

Date:

Leader of the Council:

Date:

Legionella Risk Assessment and Control

February 2006

Who is it for?

This code of practice is for Premises Managers who have responsibility for Council owned properties. It is also for those who have been assigned the responsibility for undertaking assessments of the risks associated with *legionella* bacteria in Council premises.

Those with responsibilities for managing and/or implementing the *legionella* policy in each directorate should be identified in Executive Directorate Health and Safety Policies and Group Health and Safety Plans.

What is this code of practice about?

The law requires employers and those in control of premises to carry out an assessment of the risk of exposure to *legionella* bacteria and to identify any necessary precautionary measures.

This code of practice has been produced to help you understand how an assessment of the risk of exposure to *legionella* bacteria from work activities and water systems on Harrow Council premises is undertaken, and the precautions necessary to control any risk identified.

What causes legionellosis?

Legionellosis is a group of disease including Legionnaires' disease which are caused by the inhalation of *legionella* bacteria. Legionnaires' disease is a potentially fatal infection which has symptoms similar to flu and pneumonia. *Legionella* bacteria exist naturally in external watercourses, and can easily contaminate and grow in other water systems such as air-conditioning, cooling towers and hot and cold water systems in buildings. In favourable conditions, the bacteria can multiply to critical levels in stored water. Legionnaires' disease is caused when water droplets containing the bacteria are inhaled.

The following factors are required to create a risk of acquiring legionellosis:

1. *legionella* bacteria present in the water system;
2. conditions in the water system which are suitable for the proliferation of the bacteria which are:
 - a. a temperature within the range 20 – 45 degree Celsius
 - b. a source of nutrients such as sludge, scale, rust or algae.
3. a means of creating and disseminating water droplets which can be inhaled, such as the aerosol from a shower.
4. people present who could be exposed (particularly those who are more vulnerable to infection).

Which water systems present a risk of exposure to *legionella* bacteria?

The HSC Approved Code of Practice and Guidance 'Legionnaires' disease: The control of *legionella* bacteria in water systems' details that a reasonably foreseeable risk of exposure to *legionella* bacteria exists in:

1. Water systems incorporating a cooling tower;
2. Water systems incorporating an evaporative condenser;
3. Hot and cold water systems;
4. Other plant and systems containing water which is likely to exceed 20° C and which may release a spray or aerosol (i.e. a cloud of droplets and/or droplet nuclei) during operation or when being maintained.

What do I need to do?

You need to identify if there are any water systems on your premises and ensure that a risk assessment has been carried out to identify and assess the risk of exposure to *legionella* bacteria.

The risk assessment must be carried out by a competent person. This can be an appropriately trained and experienced employee, water treatment company or consultant. In practice this normally be arranged through:

- *The Building Services Group for corporate properties*
- *Housing Services for Council housing premises.*

The assessment should be recorded and reviewed every two years, or sooner should the water system or the conditions significantly change.

Where a reasonably foreseeable risk is identified during the risk assessment of a water system, its use should be avoided. Where this is not reasonably practicable, a written 'scheme of control' is required to control the risk of people being exposed to *legionella* bacteria by the water system.

Figure 1 is a flow chart showing the general procedure to be followed for *legionella* risk assessment of water systems in Harrow Council premises.

What should the risk assessment include?

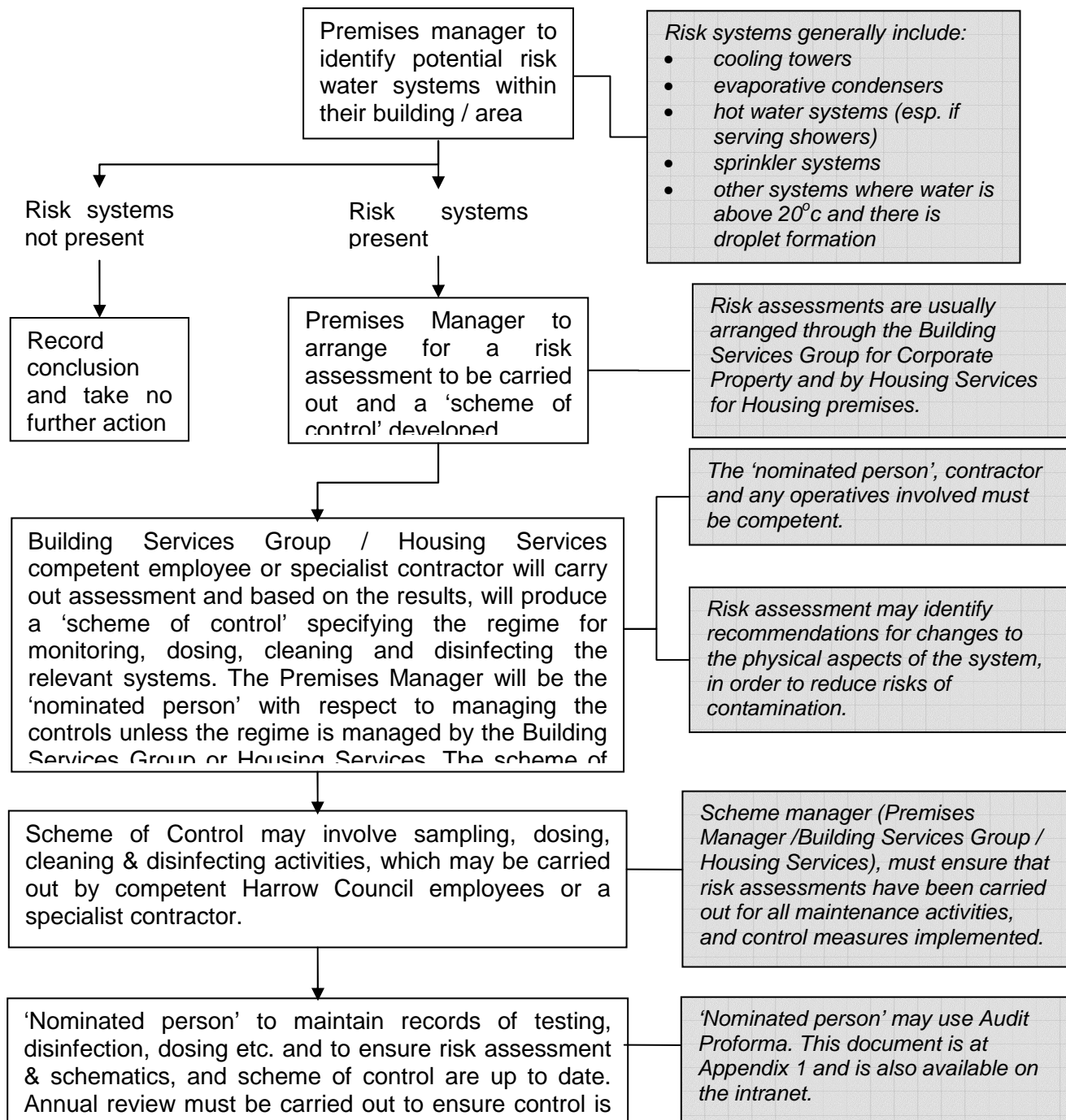
The water system needs to be considered with respect to the following factors so that any hazardous conditions present are identified:

1. Presence of bacteria

Legionella Pneumophila, the bacteria responsible for legionnaires' disease, exist naturally in external watercourses, and can easily transfer to the water used in buildings, via air-conditioning and recirculated hot and cold water systems. If the conditions are suitable, bacteria can multiply to critical levels in stored water.

Legionella bacteria may be present in very low numbers in many water systems but careful control will prevent them from multiplying.

Figure 1: Procedure for the control of *legionella* bacteria at Harrow Council premises



2. *Water conditions*

Legionella bacteria need nutrients to support growth, so it should be determined if:

- sludge, scale or rust has accumulated in cisterns or pipework
- foreign matter can be or has been allowed into tanks through poor housekeeping or maintenance
- plumbing materials have been used which do not comply with water authority by-laws
- materials have been allowed to deteriorate
- algae, organic matter, insects or vermin have been allowed to enter and remain in tanks
- a bio film is coating hard surfaces or lying on the water surface.

Water temperatures are crucial to the existence of *legionella* bacteria so the temperature of stored water should be checked.

- In water below 20°C, the bacteria remain dormant in low numbers.
- In water which is between 20°C and 45°C, the bacteria multiply, so water stored within this range is a hazard.
- In water above 45°C, bacteria growth slows.
- At 60°C, 90 per cent of legionella will die within two minutes.

Insulation can also play a part in determining the temperature of water. The following should therefore be considered:

- Insulation, or lack of insulation, which enables water to be stored at incorrect temperatures, is a hazard.
- Cold water tanks situated in warm parts of buildings are a hazard
- Tanks where water is not uniformly heated are a hazard.

Water flow is another important consideration. Low or no flow in the system (or parts of it) results in stagnation, enabling bacteria to multiply undisturbed, so hazard identification and risk assessments should look for:

- cisterns or pipework which allow water to stand undisturbed for long periods
- dead-legs — pipework or tanks which are no longer used, but are still connected to the system.

3. *Creation of an aerosol*

Any water outlets which might release a spray should be identified. These can enable droplets to be formed and disseminated into the environment, where they are then present for inhalation by a person. Some examples of outlets where spray can be produced are:

- taps
- shower heads
- spas or whirlpool baths
- pools, including hydrotherapy pools
- humidifiers
- fountains
- evaporative condensers
- wet cooling towers.

4. *People at risk*

Any people present who could be exposed to *legionella* bacteria released from the water system, should be identified. For most water systems this will include all building occupants both those at work and visitors.

For cooling towers there can be additional people outside the building who could be at risk. In closed cooling tower systems, the vapour is recirculated within the building and those at risk will be the building occupants, however, in open cooling tower systems, the vapour is released into the atmosphere and can affect others, such as people in the surrounding area and those in nearby buildings.

Some groups of people are particularly vulnerable and these include those over 40 years of age, especially if they are smokers, alcoholics, diabetics, have chronic respiratory or kidney disease, cancer, or if they are on renal dialysis or immunosuppressant drugs.

What is a Written Scheme of Control?

If a significant risk is identified and cannot be avoided, a written scheme is required which sets out how you intend to control the risk from legionella in the water system. This should include:

- An up-to-date plan or schematic diagram of the system;
- Who is responsible for carrying out the assessment and managing its implementation;
- A description of the safe and correct operating procedure for the system;
- What control methods and precautions need to be taken; and
- The checks that will be carried to ensure the scheme is effective and their frequency;
- The remedial action to be taken if the scheme is found not to be effective.

How can *legionella* bacteria be controlled?

The key to avoid proliferation of *legionella* bacteria in hot and cold water systems is to design, maintain and operate the system under conditions which prevent or control the growth of bacteria and avoid creating a spray or aerosol. In general this would include the following:

- Avoiding water temperatures between 20°C and 45°C and other conditions which favour the growth of legionella and other micro-organisms;
- Avoiding water stagnation by keeping pipe lengths as short as possible and removing redundant pipework;
- Avoiding materials that harbour or encourage the growth of legionella by providing nutrients for the bacteria;
- Keeping the system and the water in it clean and avoiding the build-up of sediments;
- Taking action to ensure the correct and safe operation and maintenance of the water system; and
- Where appropriate and safe to do so, by the use of a suitable water treatment programme.

What records need to be kept?

The following records must be kept to at least the frequencies indicated:

- Persons responsible for conducting the risk assessment, managing and implementing the written scheme;
- The significant findings of the risk assessment for 2 years;
- The written scheme for controlling the risks from exposure for 2 years;
- The results of any monitoring, inspections, test or checks carried out for 5 years.

How do I ensure that this process is being followed?

The Health and Safety Service monitor and audit compliance with the corporate *legionella* policy and procedures.

Each Directorate should have arrangements to check that the Council's *legionella* policy and procedures are being implemented at those premises managed by the Directorate.

Premises Managers should check locally that water systems have been risk assessed and are being managed according to the scheme of control.

An audit pro-forma to assist in the monitoring process is available in Appendix 1 to this document and on the health and safety forms section of the intranet.

Where can I get further help and advice?

The Harrow Health and Safety Service contact number is 020 8242 1512 (2512) and we can provide further help, advice and support. Or e-mail us at healthandsafety.services@harrow.gov.uk

Annex 1 - Control of *Legionella* Audit Pro-forma

Introduction

This audit pro-forma is based on those produced by the HSE and is intended to help you audit the arrangements in place to control *legionella* bacteria in the water systems in your premises. This pro-forma is not a risk assessment. It merely addresses the most important aspects of the ACoP, and enables you to assess your level of compliance with the requirements of the Control of Substances Hazardous to Health Regulations 2003 and the Approved Code of Practice (ACoP) — 'Legionnaires' disease: the control of *legionella* bacteria in water systems'.

It is designed to be an audit to assess the adequacy of the existing assessment and to highlight areas where further action is necessary. Wherever further action is required it will be necessary to review the relevant part(s) of your risk assessment and/or written scheme of precautions.

Further information is available in the HSC ACoP and Guidance 'Legionnaires' disease: the control of *legionella* bacteria in water systems.'

Address of premises:

Name of Auditor:

Date of Audit:

Date of review:

The Risk Assessment	Yes / No	<i>Further Action Required</i>
Did you consider whether the risk could be eliminated?		
Is there a written risk assessment for the system?		
Did the person carrying out the assessment have access to the competent help and advice when carrying out the assessment?		
Is the risk assessment recorded?		
Did you consult with employees about the assessment and the control measures?		
Have you identified the circumstances which would require a review of the assessment?		

Roles and Responsibilities	Yes / No	<i>Further Action Required</i>
Has a responsible person been identified?		
Is there a nominated deputy?		
Are contact details for these people readily available?		
Are roles and responsibilities of staff involved in the control regime clearly defined in writing?		
Have these staff received appropriate training?		
If external contractors are used, are their roles and responsibilities clearly defined in writing?		
Have you checked the competence of contractors?		
Have you considered other health and safety issues such as COSHH assessments for any chemicals used and other hazards associated with the maintenance tasks?		

The Written Scheme	Yes / No	Further Action Required
Is there a written scheme for controlling the risk from exposure to <i>legionella</i> bacteria?		
Does it contain an up to date schematic plan of the system?		
Does the plan show: <ul style="list-style-type: none"> ▪ All system plant and controls? ▪ Any standby equipment ▪ The storage and header tanks ▪ System bleed valves ▪ Origin of the water supply ▪ The pipework and routes 		
Does it contain details of the precautions to be taken to control the risk of exposure to legionella bacteria?		
Does it contain instructions for the operation of the system?		
Does the scheme contain details of the checks that are to be carried out to ensure that the scheme is effective, and their frequency?		

Design and Construction - General	Yes / No	Further Action Required
If new system is being fitted, do the materials or fittings used support the growth of micro-organisms?		
Are low corrosion materials used?		
Are any thermostatic mixing valves sited as close to the point of use as possible?		

Design and Construction - Cold Water system	Yes / No	Further Action Required
Are low use outlets installed upstream of high use outlets?		
Has cold water storage been assessed and minimised, ie only hold enough for one day's use?		
Where possible, is piping insulated and kept away from heat sources?		
Is the tank: <ul style="list-style-type: none"> ▪ Fitted with a cover and insect screens on pipes open to the atmosphere? ▪ Located in a cool place and protected from extremes of temperature? ▪ Accessible? 		
Design and Construction - Hot Water system		
Does calorifier storage meet normal daily fluctuations in hot water use but maintain a supply temperature of 50oC?		
Are hot water distribution pipes insulated?		
If more than one calorifier is used are they connected in parallel? Does the calorifier have the following: <ul style="list-style-type: none"> ▪ A drain valve? ▪ A temperature guage on the inlet and outlet? ▪ An access panel? 		

Operation and Maintenance	Yes / No	Further Action Required
If the water supplied to your building is not mains supply, has the water been pre-treated to make sure it is of mains quality?		
Is the entire contents of the calorifier, including base, heated to 60oC for an hour each day, eg. using a shunt pump?		
Are all outlets that are no longer required cut back as far as the main pipe run?		

Water treatment programme	Yes / No	Further Action Required
Is there a water treatment programme in place?		
Is the temperature used as a control method? (If yes complete the section on temperature monitoring)		
Are biocides used as a control method? (If yes complete the section on biocide monitoring)		

Temperature Monitoring	Yes / No	Further Action Required
If there is a risk of scalding (eg. where elderly, young or disabled people may use the outlets), are thermostatic mixing valves fitted?		
Is the temperature of sentinel hot and cold outlets checked monthly?		
If fitted, is the temperature of the supply water to the thermostatic mixing valve checked on a monthly basis?		
Is the temperature of the water in the outlet and return pipes of the calorifier checked on a monthly basis?		
Is the temperature of the incoming cold water supply checked on a six-monthly basis?		
Is the temperature of a representative number of hot and cold water outlets checked on an annual basis?		

Biocides Monitoring	Yes / No	Further Action Required
If there is a risk of scalding (eg. where elderly, young or disabled people may use the outlets), are thermostatic mixing valves fitted?		
Is the temperature of sentinel hot and cold outlets checked monthly?		
If fitted, is the temperature of the supply water to the thermostatic mixing valve checked on a monthly basis?		
Is the temperature of the water in the outlet and return pipes of the calorifier checked on a monthly basis?		
Is the temperature of the incoming cold water supply checked on a six-monthly basis?		

Is the temperature of a representative number of hot and cold water outlets checked on an annual basis?		
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General Monitoring	Yes / No	Further Action Required
Are the following carried out annually? <ul style="list-style-type: none"> ▪ Visual check of the coldwater tank and the water in it? ▪ Check to see if there is reasonable flow through the cold water tank? ▪ A drain of the calorifier to check for debris? ▪ A check on the plans for hot and cold water to ensure they are up to date? ▪ A check on the existence of water connections to outside services? 		
Are results of tests, checks and remedial actions recorded?		

Cleaning and Disinfection	Yes / No	Further Action Required
Have the circumstances when cleaning and disinfection of the hot water system would be appropriate been identified?		
If cleaning and disinfection were to be carried out, which of the following methods would be used? <ul style="list-style-type: none"> ▪ Thermal ▪ Chemical 		
Are procedures in place for the chosen method of cleaning and disinfection?		

Contractor details

Please complete the details of any contractors below

Risk Assessment:

Name:	
Address:	
Contact:	
Phone:	

Ongoing water treatment contractor:

Name:	
Address:	
Contact:	
Phone:	

Cleaning and disinfection contractor

Name:	
Address:	
Contact:	
Phone:	
