



Health & Safety Water Management Policy – Control of Legionella bacteria within water systems

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¹ or earlier if change in legislation or on risk assessment

Amendment Control

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Policy Summary

The policy of Edinburgh Napier University is to provide and maintain safe and healthy working conditions, equipment and systems of work for all staff, students and others, and to provide such resources, information, training and supervision as needed for this purpose.

The University will provide resource and maintain appropriate management systems, systems of work and equipment to ensure that Legionella risks to all staff, students and others are controlled. Suitable information, instruction, training and supervision will be provided to all those involved in the control of Legionella.

The University will adopt the principles of control as set out in the HSE publication 'Legionnaires disease: The control of Legionella bacteria in water systems – Approved Code of Practice and Guidance (L8)'. Other publications, including those detailed in Section 8, will also be used to source best practice guidance where appropriate.

The management of Legionella risk will be a continual commitment by the University and will involve regular monitoring and progress meetings, a risk assessment programme, monitoring, inspection and record keeping.

This policy is formally accepted by the University.

The University will do all that is reasonably practicable to comply with its requirements and will make the necessary resource available.

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1 Executive Summary

Edinburgh Napier University accepts its responsibility under the Health and Safety at Work etc. Act and the Control of Substances Hazardous to Health Regulations, to take all reasonable precautions to prevent or control the harmful effects of contaminated water to students, visitors, staff and other persons working at or using its premises.

The aim of this Policy is to introduce a structured Procedural and Reporting Schedule for the Management and Control of Legionellosis as required specifically by the Health and Safety Commissions Approved Code of Practice (L8). The University will undertake to:

- Identify and assess sources of risk.
- Prepare a control system for preventing, reducing or controlling the risk.
- Implement, manage and monitor precautionary measures deployed.
- Maintain suitable and sufficient records of the precautions implemented and carry this out for all of the premises within the University's control.
- Appoint a person to be managerially responsible for the maintenance and leadership of the control system and measures adopted.

Management has the overall responsibility for the implementation of these procedures to ensure that safe, reliable hot and cold water supply, storage and distribution systems are maintained and operated within the University.

The Duty Holder or deputy will appoint, in writing, a Responsible Person (Legionella) to take day-to-day responsibility for the control of the hot and cold water services and be responsible for assessing, recording and controlling the risks posed by the presence of Legionella bacteria.

The primary defence strategy for reducing the risks posed by Legionella is by a temperature control regime. This regime may be supplemented by the additional use of chemicals and other water treatment methods.

Management has a statutory duty to ensure that compliance is active, continuous and effective. Therefore, the University must be able to demonstrate it has:

- Identified all the relevant factors (Risk Assessment).
- Instituted the appropriate corrective or preventive actions (Control System).
- Monitoring systems in place that ensure the effective implementation of the required solutions (Management System).

This Policy applies to all areas of the University without exception.

2 Introduction and Purpose

Legionnaires disease is a potentially fatal form of pneumonia which can affect anybody, but which principally affects those who are susceptible because of age, illness, immunosuppression, smoking etc. It is caused by the bacterium *Legionella pneumophila* and related bacteria. *Legionella* bacteria can also cause less serious illnesses, which are not fatal or permanently debilitating. The collective term used to cover the group of diseases caused by *Legionella* bacteria is Legionellosis.

Legionnaires disease is normally contracted by the individual inhaling *Legionella* bacteria either in tiny droplets of water or in droplet nuclei (particles left after the water has evaporated).

Incubation period is 2-10 days (usually 3-6 days).

3 Roles and Responsibilities

The Director of Property & Facilities has overall accountability for all aspects of the quality of water supplies. The University has appointed the Maintenance Operations Manager to be the Responsible Person to manage *Legionella* control within its estate. The University has also appointed a Responsible Person for the Student Residences.

All relevant persons shall fully appreciate the actual and potential risks of *Legionella* and the concept of risk management. Although compliance with the guidance may be delegated to staff or undertaken by contract, accountability cannot be delegated.

The University responsibilities are listed below:

3.1 Duty Holder

The Director of Property & Facilities as the assigned Duty Holder to appoint a responsible person and delegate total authority to allow compliance.

3.2 Director of Property & Facilities

To be the Duty Holder

The ultimate responsibility for complying with the duties are delegated to Property & Facilities and rests with the Director of Property & Facilities. The Director has required that the Maintenance Department organise a management system and implement all necessary arrangements required to meet this delegated duty.

3.3 Responsible Person

The Responsible Person is responsible to the Director of Property & Facilities and will report any significant difficulties encountered whilst complying with the requirements of L8. The Responsible Person will be a person of suitable experience and have an understanding of hot and cold water systems and the danger from *Legionella* and similar bacteria. The Responsible Person will receive any necessary training and have access to competent advice as is necessary to be able to discharge their duties. Resources are made available from the Maintenance budget to enable, as far as is reasonably

practicable, compliance with statutory legislation and ACoP L8. The main duties of the Responsible Person are as follows:

- Identify and assess sources of risk.
- Prepare a scheme (or course of action) for preventing or controlling the risk.
- Implement and manage the scheme.
- Keep records and check that what has been done is effective.
- Liaise and provide advice on Legionella controls to Schools/Services as requested.
- Identify and provide training for persons with delegated responsibilities.
- Design a compliance policy and system (utilising water treatment and environmental specialists as necessary).
- Order works from providers as necessary.
- Ensure compliance with Edinburgh Napier University Water Management Policy and procedures.
- Ensure any tasks allocated by testing are completed on schedule and remedial jobs created as necessary, with the response category appropriate for task.
- Facilitate any monitoring or inspection work.
- Facilitate and ensure completion of any remedial work identified.
- Ensure all necessary documentation is completed and records held within site logbooks.
- Audit performance.

3.4 Project Manager

To be the Deputy Responsible Person for the design of modified or new pipework

- Ensure systems are designed to ensure compliance with the ACOP L8 document.
- Ensure systems are installed to ensure compliance with the ACOP L8 document.
- Ensure compliance with the Edinburgh Napier University Water Management Policy and procedures.
- Ensure all necessary documentation is completed and returned to the Maintenance Operations Manager for recording in the site logbooks.

3.5 Responsible Person (Residences)

The Responsible Person (Residences) is responsible to the Director of Property & Facilities and will report any significant difficulties encountered whilst complying with the requirements of L8. The Responsible Person will be a person of suitable experience and have an understanding of hot and cold water systems and the danger from Legionella and similar bacteria. The Responsible Person will receive any necessary training and have access to competent advice as is necessary to be able to discharge their duties. Resources are made available from the Maintenance budget to enable, as far as is reasonably practicable, compliance with statutory legislation and ACoP L8. The main duties of the Responsible Person are as follows:

- Identify and assess sources of risk.
- Prepare a scheme (or course of action) for preventing or controlling the risk.
- Implement and manage the scheme.
- Keep records and check that what has been done is effective.
- Identify and provide training for persons with delegated responsibilities.
- Design a compliance policy and system (utilising water treatment and environmental specialists as necessary).
- Order works from providers as necessary.

- Ensure compliance with Edinburgh Napier University Water Management Policy and procedures.
- Ensure any tasks allocated by testing are completed on schedule and remedial jobs created as necessary, with the response category appropriate for task.
- Facilitate any monitoring or inspection work.
- Facilitate and ensure completion of any remedial work identified.
- Ensure all necessary documentation is completed and records held within site logbooks.
- Audit performance.

3.6 Projects Team

- Ensure compliance with Edinburgh Napier University Water Management Policy and procedures.
- Ensure systems are designed to ensure compliance with the ACOP L8 document.
- Ensure systems are installed to ensure compliance with the ACOP L8 document.
- Ensure all necessary documentation is completed and returned to the Maintenance Operations Manager for recording in the site logbooks.

3.7 Specialist Water Treatment/Environmental Service Company

- Carry out risk assessments.
- Carry out tests, as required, on water systems.
- Carry out investigations and remedial works as instructed.
- Provide advice to the Responsible Person to enable compliance with the Edinburgh Napier University Water Management Policy and procedures.

3.8 Maintenance Department

- Ensure any reactive tasks are completed on schedule within the response category appropriate for task.
- Ensure all necessary documentation is completed and returned to the Maintenance Operations Manager.

3.9 Residence Manager

- Ensure compliance with Edinburgh Napier University Water Management Policy and procedures.
- Facilitate any monitoring or inspection work.
- Facilitate any remedial work identified.
- Ensure shower heads are cleaned and de-scaled, as required.
- Ensure flushing of infrequently used outlets is carried out as required and records kept.
- Ensure all necessary documentation is completed and returned to the Responsible Person (Residences) for recording in the site logbooks for tasks carried out by residences staff.
- Ensure that **no** modifications/alterations or additions to water systems are carried out unless written approval is obtained from the Maintenance Department.

3.10 Deans of School/Directors of Service

- Ensure compliance with Edinburgh Napier University Water Management Policy and procedures.

- Ensure departmental equipment is maintained in house or by contractors to standards necessary for the control of Legionella.
- Keep records of departmental equipment servicing and maintenance.
- Facilitate any monitoring or inspection work.
- Facilitate any remedial work identified.
- Identify infrequently used outlets to the Maintenance Operations Manager.
- Ensure that **no** modifications/alterations or additions to water systems are carried out unless written approval is obtained from the Maintenance Department.
- Notify the Maintenance Department of any equipment not on a testing schedule.

3.11 Contractors

- Ensure compliance with Edinburgh Napier University Water Management Policy and procedures.
- Ensure all necessary documentation is completed and returned to the Maintenance Operations Manager for recording in the site logbooks.

3.12 Head of Health & Safety

- Reporting incidents under RIDDOR.
- Assist the Duty Holder and Responsible Persons in exercising their duties in respect of the Edinburgh Napier University Water Management Policy and procedures.

The effectiveness of the Water Management Policy will depend on the full co-operation of every member of staff and contractor employed to implement the written scheme. They should immediately report any faults or problems found within the hot and cold water system during inspections and planned preventative maintenance (PPM). In addition persons employed to work on any hot and cold water system must report any concerns they may have about those systems (i.e. by reporting any potential dead legs). They should co-operate with any safety measures required to ensure that water supplies or water using equipment operate safely.

4 Control Methodology

4.1 Risk Assessment Policy

University buildings and plant are considered to fall into four categories for the purposes of precautions against Legionella infection. These are:

Class 1 – Low Risk

A small domestic or academic building with little or no water storage, no atomisation present (no shower heads or spray taps) and not used for business purposes.

Class 2 - Moderate Risk

A larger domestic or academic building with stored water, no atomisation present (no shower heads or spray taps) and used for business purposes, residential/domestic premises, including large complexes with self contained living units. Typically here the water systems are of the "domestic" type, i.e. with a gravity cold water feed tank to a conventional copper storage cylinder, distribution may or may not be pumped.

Class 3 – Significant Risk

A larger domestic or academic building with stored water, atomisation present (shower heads or spray taps) and used for business purposes, large residential or academic premises, usually with a large feed tank fed by either gravity or circulation pump to a storage calorifier with a pumped distribution circuit including flow and return.

Class 4 – High Risk

A larger domestic or academic building with stored water, atomisation present (shower heads or spray taps) and used for business purposes, any special circumstances or unusual equipment (i.e. cooling towers, air handling plant, humidifiers, whirlpools or buildings occupied by "at risk groups") - cooling towers associated with air conditioning systems. There are currently none of these units in the University.

The University will conduct risk assessments in respect of Legionella bacteria and have them updated every two years, or when refurbishment takes place, or when a new building is commissioned.

The University will employ professionally qualified and competent companies to carry out the risk assessment on its behalf, and ensure they are competent under the duty of care. The risk assessments are held centrally by the Maintenance Department. The Maintenance Operations Manager in accordance with this document will instigate reviews.

4.2 Schematics

A site survey of all water systems will be conducted culminating in a schematic drawing and logbook for each system, which will be instigated, held and updated by the Maintenance Department. Water system schematics are produced for all hot and cold water systems, with the exception of point of use water heaters and small tenanted domestic premises served by individual single-pipe water systems.

The schematics show the storage systems in plant rooms and tank rooms. Distribution schematics show sentinel outlets on block plans (where available).

For each water system that presents a risk from Legionella bacteria, a schematic or drawing shall be held, showing:

- Origin of water supply
- General layout of the system
- How the system operates
- All associated storage and header tanks
- All standby equipment
- Any parts of the system that may be out of use temporarily
- Any problem areas such as dead legs
- Regular operation and test points

These schematics/drawings may also show:

- All system plant, e.g. water softeners, filters, strainers, pumps, non-return valves and all outlets, for example showers, wash hand basins etc.
- All associated pipework and piping routes

Drawings/schematics shall be checked to coincide with risk re-assessment, to ensure that they are up to date.

The degree of complexity of schematics will be as follows:

Risk	Drawing/Schematic Type
High	As-fitted drawing, water storage system schematic and simple distribution schematic
Significant	Water storage system schematic and simple distribution schematic
Moderate	Water storage system schematic
Low	None

4.3 Persons at Risk

Risk assessment has identified that University staff, students, visitors and the general public using adjacent buildings and thoroughfares may be at risk. Areas of risk where control is necessary:

- Showers
- Domestic hot water systems
- Tank fed cold water systems
- Infrequently used outlets
- Drinking water distribution
- Humidifiers
- New equipment/alterations
- Residences
- Any other area or equipment that may create a tiny droplet water spray

5 Control Strategy

Property & Facilities will schedule, design, order and monitor all controls necessary to manage Legionella bacteria within the University.

The Maintenance Department led by the Maintenance Operations Manager (Responsible Person) will implement, procure, advise and report on controls necessary to manage Legionella bacteria within the University.

Individual University departments will ensure that departmental equipment is serviced (including inspection, cleaning and disinfecting) and maintained to the standard required to control Legionella bacteria within the University. Individual University departments will ensure records of servicing and maintenance are kept.

The Maintenance Department will produce a Water Systems logbook for each building (or group of buildings) on campus that will contain all records of control measures implemented.

These will be held on campus and centrally within the Maintenance Department and contain the following:

- Risk Assessment for the system
- Schematic diagrams of the system
- Records of control checks taken
- Chlorination record certificates
- Records of any remedial work carried out

Independent audits of the systems will be undertaken.

The University adopts a temperature regime, however where historically problems have been encountered in maintaining temperature control and cost prohibits an engineered solution then additional control measures such as of Biocide treatment in the form of Chlorine Dioxide dosing plant will be considered.

5.1 Control of areas of risk – showers (shower heads and connecting hoses)

- Each shower head and associated hose should be cleaned and de-scaled on a quarterly basis. A Water Treatment/Environmental Service contractor or the Maintenance Department staff should carry out the work and complete the record sheets.
- Records are to be returned to the Maintenance Department for filing in the building logbook. A method statement for all such work should be issued and filed in the logbook.
- If left unused for more than a week then outlet to be run for 10 minutes to flush/purge the stagnant water in the pipework.

5.2 Control of areas of risk – domestic hot water systems

The University adopts a temperature regime where domestic hot water is stored at 60°C and is distributed with a flow return temperature of 50°C minimum.

The storage calorifiers should be designed and installed to ensure that the total volume of stored water is heated and maintained at 60°C. This may be achieved by the use of a shunt pump set to operate via time switch to heat the full calorifier to 60°C for one hour per day or the utilisation of extended coil calorifiers to promote convective mixing during heating.

Each system should be fitted with the circulation pump on the return leg, unless sufficient electrical trace heating is installed. All calorifiers are to be fitted with 28mm full flow quarter turn drain valves. The use of Plate Heat Exchangers will be considered as an alternative to calorifiers where it is deemed appropriate.

Each system should have sensors fitted to the flow and return legs attached to the Building Energy Management Systems (BEMS), monitored by Property & Facilities and a weekly log taken to confirm the correct operation. Deviations are reported to the Maintenance Operations Manager.

No blending/thermostatic mixing valves are to be installed except where there is a specific DDA requirement or a specific health and safety requirement relating to activities undertaken in laboratory areas. The hot and cold water supplies to any blending/thermostatic mixing valves shall each be fitted with a type EA – verifiable check valve to prevent the mixing of hot and cold water supplies. This shall be in addition to any integral protection within the blending/thermostatic mixing valves.

It is University policy to actively remove any existing spray emission type taps and prohibit the installation of any new. Taps that produce a spray emission as a result of lime scale should be identified to the Maintenance Department for replacement.

Only Water Regulations Advisory Scheme (WRAS) approved water fittings and materials are to be used. All fittings and materials used should be currently listed in the current edition of the Water Fittings and Materials Directory. Materials such as natural rubber, hemp and linseed oil-based jointing compounds, fibre washers and flexible rubber hoses are excluded from use.

5.3 Control of areas of risk – instantaneous water heaters

The appropriate electrical or gas statutory inspections will be carried out and the records retained centrally within the Maintenance Department. Instantaneous water heaters are considered low risk.

5.4 Control of areas of risk – water heaters

This classification shall be applied to hot water generators with a storage capacity of 15 litres or less.

Monthly temperatures are to be taken and recorded on the water storage temperature log sheet and returned to the Maintenance Department for filling in the building logbook. Expectation: hot water above 50°C within 1 minute of running outlet, with a maximum temperature of 55°C. Anomalies are to be reported immediately to the Maintenance Operations Manager.

Annual maintenance of each water heater shall comprise a full pasteurisation process. A representative condition water sample shall be taken from a number of water heaters. The operative shall record the process on the issued maintenance sheet which is then returned to the Maintenance Department for recording in the building logbook.

5.5 Control of areas of risk – calorifiers

This classification shall be applied to hot water generators with a storage capacity greater than 15 litres

Water temperatures entering and leaving calorifiers are to be checked weekly via the BMS by Property & Facilities. Monthly temperatures are to be taken and recorded on the water storage temperature log sheet and returned to the Maintenance Department for filing in the building logbook. Anomalies are to be reported immediately to the Maintenance Operations Manager.

Annual maintenance of each calorifier shall be carried out after a condition sample of the drain water has been obtained. A visual inspection of the internal condition shall be carried out which may, because of access difficulties, necessitate use of an endoscope and a digital photograph shall be taken. The calorifier is isolated from the building circuit, the shell is drained down and the internal surface is inspected and cleaned if necessary. Where the inspection and cleaning is not possible, as this would be destructive to the vessel, the Maintenance Operations Manager shall annotate the maintenance record sheet. Immediately prior to the calorifier being returned to service a full pasteurisation process is carried out and the operative records the process on the issued maintenance sheet which is then returned to the Maintenance Department for recording in the building logbook.

5.6 Control of areas of risk – tank fed cold water systems

The University adopts a temperature regime that requires that cold water storage must not exceed 20°C. Cold water storage tanks must be designed and installed with appropriate capacity to ensure the turnover of stored water does not exceed 24 hours. Where new tanks are to be installed, Glass Reinforced Plastics (GRP) sectional tanks, externally flanged with integral insulation and fitted with a quarter turn side drain valve to ease the process of tank cleaning and draining, are to be fitted. **Under no circumstances are galvanised steel cold water tanks to be installed.**

Multiple tank installations must be installed in parallel, to allow for the chlorination and cleaning of the tanks without interrupting the cold water/hot water service to the building. Multiple tank installations must be installed with out-going connections configured to ensure that there is an equal flow through all tanks to prevent water stagnation.

Tanks storage levels should be controlled by delayed action float valves to allow for positive water displacement in the tank. The incoming feed to the tank is at the opposite end to the outgoing connections.

Wherever possible new tanks are partitioned or a bypass is installed to allow for the chlorination and cleaning of the tanks without interrupting the cold water/hot water service to the building. Where partitioned tanks are installed the policy is to operate both tanks together except for chlorination and maintenance.

It is University policy to actively remove any existing spray emission type taps and prohibit the installation of any new.

Only Water Regulations Advisory Scheme (WRAS) approved water fittings and materials are to be used. All fittings and materials used should be currently listed in the current edition of the Water Fittings and Materials Directory. Materials such as natural rubber, hemp and linseed oil-based jointing compounds, fibre washers and flexible rubber hoses are excluded from use.

Control regime

To be inspected six monthly by a specialist contractor - consider:

- Condition inside/outside
- Condition of thermal insulation
- Is lid fitted correctly?
- Is water clean and debris free?
- Storage level control operating correctly?
- Condition of overflow pipe
- Capacity
- Inspection to be recorded on the issued record sheet and returned to the Maintenance Department for filing in the building logbook

5.7 Control of areas of risk – infrequently used outlets

Water outlets that are unused for a week or more should be flushed through on a weekly basis and this should be recorded. Water outlets that are unused for a week or more that are difficult to flush should only be returned to use after purging and this should be recorded. When flushing or purging the outlets, any difficulties or problems encountered should be reported to Property & Facilities Service Desk and a remedial job created.

Special consideration should be given to disabled toilets as these are used less frequently. A shower which may be unused for a week or more must be flushed through on a weekly basis and this should be recorded.

5.8 Control of areas of risk – drinking water distribution

As a policy all drinking water outlets should be serviced from a separate supply pipe direct from the mains service or a distribution pipe drawing water from a storage cistern supplying wholesome water. Drinking water and drink dispensers should only be attached to the rising main. Drinking water outlets to be located in designated areas only. All taps which are suitably supplied and positioned for potable water use are labelled “Drinking Water”.

The drinking water main is to supply at its extremity a urinal-flushing cistern (or similar) programmed for 7-day operation in order to prevent water stagnation.

No alterations or additions to the drinking water supply to be made without written authorisation from the Maintenance Department. All operatives working on water systems on all University sites will be required to be a member of The Scottish and Northern Ireland Plumbing Employers’ Federation

(SNIPEF) scheme. Any department buying in equipment required to be connected to the existing service **must** inform the Maintenance Operations Manager.

Only Water Regulations Advisory Scheme (WRAS) approved water fittings and materials are to be used. All fittings and materials used should be currently listed in the current edition of the Water Fittings and Materials Directory. Jointing materials such as natural rubber, hemp and linseed oil-based jointing compounds and fibre washers are excluded from use.

Wholesome water storage - storage cisterns supplying wholesome water shall be periodically sampled to ensure water quality.

5.9 Control of areas of risk – air washers

There are currently **none** of these units in the University. **Note:** air washers are **not permitted** to be used in conjunction with any new build or refurbishment project.

5.10 Control of areas of risk – humidifiers (ultrasonic humidifiers, fogging systems and water misting systems)

No spray humidifiers may be newly installed. Departments must notify Property & Facilities of the locations of all existing spray humidifiers. Existing spray humidifiers must be regularly inspected, cleaned, disinfected and maintained.

Departments must notify Property & Facilities of the locations of all ultrasonic humidifiers, fogging systems and water misting systems. It is the responsibility of the individual department to arrange for the inspection, cleaning, disinfecting and maintenance of all ultrasonic humidifiers, fogging systems and water misting systems to the standard necessary for the control of Legionella.

5.11 Control of areas of risk – ornamental water fountains (internal or external)

In view of publicised cases of Legionnaires disease attributable to self-circulating water features/ornamental fountains, it is University policy to actively remove any existing and prohibit the installation of any new.

5.12 Control of areas of risk – new equipment, replacement equipment and alterations

All new systems, replacement equipment or alterations should be designed and installed to minimise the risk of Legionella bacteria and ensure compliance with the ACOP L8 document, Edinburgh Napier University Water Management Policy and procedures and BS 1710:1984.

- All operatives, working on water systems on all University sites will be required to be members of the Water Industry Approved Plumber scheme.
- All alterations (where possible) or new installations should only be carried out using copper pipe-work and fittings.
- The University Asbestos Register must be consulted prior to any intrusive works.
- Only non-spray emission water taps are to be installed.
- Only shower heads that are designed to give large droplets should be installed.
- All installed pipe-work to be insulated, including cold water services.
- Water systems are to be designed so that there are NO dead legs or pockets created.
- All hot water systems must be designed with a return on them or suitable electric trace heating provided.
- No blending/thermostatic mixing valves are to be installed except where there is a specific DDA requirement or a specific health and safety requirement relating to the activities undertaken in laboratory areas.
- The hot and cold water supplies to any blending/thermostatic mixing valves shall each be fitted with a type EA – verifiable check valve to prevent the mixing of hot and cold water supplies. This shall be in addition to any integral protection within the blending/thermostatic mixing valves.
- Modifications to existing pipework, including removal of branches, must include cutting back to the main as it is totally unacceptable to leave pipework capped at the end and unused.
- Only Water Regulations Advisory Scheme (WRAS) approved water fittings and materials are to be used.
- All fittings and materials used should be currently listed in the current edition of the Water Fittings and Materials Directory.
- Jointing materials such as natural rubber, hemp and linseed oil-based jointing compounds and fibre washers are excluded from use.
- All University departments to have all proposed alterations to water systems approved by the Maintenance Department prior to works commencing.
- All Contract Administrators to ensure approval is obtained before work commencement.
- All Projects to include costs for updating risk assessments and schematic drawings as agreed with the Maintenance Department.
- If a system is taken out of use for alterations or an area is unused for over 7 days the Contract Administrator must ensure that one of the following options are taken:
 - Completely drain the system down followed by cleaning and disinfection prior to re-use.
 - Instigate a regime of regular flushing of the risk systems during the out of use period followed by cleaning and disinfection prior to re-use.

5.13 Control of areas of risk – residences

The logbook for the systems will be held within the Maintenance Department containing the following:

- Risk Assessment for the system
- Schematic diagrams of the system
- Records of control checks taken
- Chlorination record certificates
- Records of any remedial work carried out

A suitably trained contractor undertakes the maintenance/monitoring tasks. A planned maintenance work order is issued identifying the areas where the maintenance activities are to be undertaken and the appropriate log sheet/report sheet is then completed, dated and signed. The docket will be directed to the Responsible Person (Residences) to expedite. The Responsible Person (Residences) must ensure that the completed log sheets/report sheets are returned to the Maintenance Department.

5.14 Control of areas of risk – fire hose reels

The university has removed all fire hose reels and prohibited the installation of any new.

5.15 Control of areas of risk – cooling towers associated with air conditioning equipment

There are currently **none** of these units in the University. **Note:** cooling towers of this type are **not permitted** to be used in conjunction with any new build or refurbishment project.

All wet cooling towers and evaporative condensers must be notified to the local authority on an approved form under the Cooling Towers and Evaporative Condensers Regulations.

6 Management Strategy

6.1 Training and instruction

Staff involved in the management of water systems will be trained by a competent person to carry out their responsibilities. The services of a specialist water treatment/environmental services company will be retained to advise as appropriate.

6.2 Sampling and monitoring

Table below details the routine sampling required as part of this Policy.

System / Service	Task	Frequency
Domestic cold water tank	Incoming mains cold water temperature	Six monthly
	Tank water temperature	Six monthly
Domestic cold water outlets	Sentinel tap temperatures	Monthly
	Temperature at representative number of taps on a rotational basis	Annually
Domestic hot water calorifiers	Flow and return temperature	Monthly
Domestic hot water outlets	Sentinel tap temperatures	Monthly
	Temperature at representative number of taps on a rotational basis	Annually
Thermostatic mixing valves	Inlet temperature	Six monthly
	Outlet temperature	Six monthly

6.3 Water temperature checks

Temperature checks on the calorifier and distribution system should be carried out as detailed below on a monthly, six monthly and annual basis. In the event of a non-compliance, the Maintenance Operations Manager shall be informed immediately. Use of a digital thermometer with a touch and immersion probe is recommended.

Although the HSE recommends spot temperature checks, continuous monitoring using the BMS System will be necessary in certain circumstances, dependent on the risk assessment findings.

Cold water storage tanks

Cold water storage tank temperatures should be checked during periods of high ambient temperatures (e.g. afternoons between June and August), water temperatures should be no greater than 20°C. At the same time, the furthest and nearest draw off points in the system should be checked to ensure that the water distribution temperatures are no greater than 20°C within 1 minute of running the water (at full flow). A similar temperature check regime should be undertaken during the winter months to identify the performance of cold water distribution systems and the impact of heat gain from heating systems.

- The stored cold water should not be more than 20°C and must not increase by more than 2°C above the incoming water supply. If an abnormally high storage temperature is recorded, the incoming water supply temperature must also be recorded, and entered in the comments field on the cold water tanks inspection sheet.
- If the differential temperature between the incoming and stored water is greater than 2°C, the water should be run off and monitoring continued until the situation is resolved.
- Anomalies are to be reported immediately to the Maintenance Operations Manager.

Hot and cold water distribution temperatures from sentinel taps

For domestic hot water services, these are the first and last taps on a re-circulating system. For cold water systems or non-recirculating hot water systems this is the nearest and furthest taps from the storage tank.

- Maintenance Department staff will be instructed to take tap temperature of the sentinel taps monthly in each building using calibrated equipment.
- All results are to be recorded on the issued water storage temperature log sheet and returned to the Maintenance Department for filing in the building logbook.
- Expectations: cold water below 20°C after running for 2 minutes, hot water above 50°C within 1 minute of running outlet, with a maximum temperature of 55°C.
- Anomalies are to be reported immediately to the Maintenance Operations Manager.

General taps - representative number of taps on a rotational basis

In order to ensure that the whole system is reaching satisfactory temperatures for Legionella control, the outlet temperatures should be taken from a representative number of outlets other than sentinel taps. Where water temperatures fail to satisfy the criteria described, the Maintenance Operations Manager shall be informed, and a full investigation must follow.

- Annually representative tap temperatures on a rotational basis on each floor of the building(s) served by the water system are to be taken by the Maintenance Department.
- All results are to be recorded on issued record log sheet and returned to the Maintenance Department for filing in the building logbook.
- Expectations: cold water below 20°C after running for 2 minutes, hot water above 50°C within 1 minute of running outlet, with a maximum temperature of 55°C.
- Anomalies are to be reported immediately to the Maintenance Operations Manager.

Calorifier flow and return temperatures

Outgoing water from the calorifier should be at least 60°C, and water returning to the calorifier should be at least 50°C. These temperatures can be taken from adequately calibrated temperature gauges fitted to the vessel and return pipework. If temperature gauges are not fitted, then suitable surface temperature probes may be used.

Input temperature to thermostatic mixer valves

Where fitted, the input temperatures to thermostatic mixer valves should be at least 50°C within a minute of running the water. Outlets with TMV's should be monitored on a sentinel basis as detailed above.

Incoming mains cold water

Where there is a cold water storage tank, this should be measured at the ball valve outlet. The water should preferably be no greater than 20°C. However, during a prolonged hot summer the incoming

water may rise above this temperature. Under the Water Supply [Water Quality] (Scotland) Regulations, water utilities are permitted to supply water to premises at temperatures up to 25°C. If incoming water temperatures are above 20°C, the water undertaker should be advised to see if the cause of the high temperature can be found and removed. Monitoring should ideally be carried out so that one check takes place in the summer months and the other in the winter months.

6.4 General Microbiological/Legionella sampling in hot/cold water systems

Every 3 months a random water sample will be taken by a specialist Water Treatment/Environmental Service contractor for analysis by a UKAS laboratory for the presence of Legionella. This independent audit verifies whether the temperature control regime adopted by the University is maintaining the levels of Legionella within safe limits. Results will be recorded and returned to the Maintenance Department for filing in the building logbook.

The Water Treatment/Environmental Service contractor shall provide a standard of service described in the Code of Conduct for Service Providers produced by the British Association for Chemical Specialties and the Water Management Society and hold a current registration certificate issued by the same organisation. They shall attend the sites as required and take samples. The water samples shall be tested for Bacteria (total viable colony count) cfu (coliform faecal units).

Samples for general microbiological testing i.e. total aerobic bacterial counts at 22°C and 37°C, coliforms and E.Coli are also taken:

- One week following handover of a new building or water system
- As part of the routine monitoring of drinking water tanks
- In response to taste or odour or sustained discoloured water complaints

When such samples are taken, a mains supply sample should be taken as a control, to verify whether the supply could be the source of any identified problems. The water supplier is also contacted for distribution zone water quality data, for the same reason.

Samples for Legionella testing are also taken:

- Monthly from hot water systems treated with biocides where storage and distribution temperatures are reduced from those recommended in the HSE's ACOP/Guidance Document L8. At the time of preparation of these procedures, there is only one such system within the organisation.
- Weekly from hot water systems where control levels of the treatment regime, i.e. temperature in this case, are not consistently achieved – these samples should be taken until the system is brought back under control.
- When an outbreak is suspected or has been identified.

Any detection above the control limits shall be compared with the current condition levels supplied by the local water supplier and may trigger cleaning, disinfection and a review of the system and control methods.

Action Level	Criteria sample	Action
1	TVC @ 22°C = <200 & TVC @ 37°C <100	No action 1 day at 37°C < 10 cfu/ml 3 days at 22°C < 100 cfu/ml Coliform/E.coli nil
2	TVC @ 22°C = 201 - 1000 & TVC @ 37°C 101-500	Either: <ul style="list-style-type: none"> • If only one or two samples are positive, system should be re-sampled. If a similar count is found again, a review of the control measures and risk assessment should be carried out to identify any remedial actions. • If the majority of samples are positive, the system may be colonised, albeit at a low level with Legionella. Disinfection of the system should be considered but an immediate review of control measures and risk assessment should be carried out to identify any other remedial action required. Re-sample. If the results from second sample fall into this category again move to action level 3.
3	TVC @ 22°C = >1001 & TVC @ 37°C >501	<ul style="list-style-type: none"> • The system should be re-sampled and an immediate review of the control measures and risk assessment carried out to identify any remedial actions including possible disinfection of the system. • Sample the mains cold water weekly until a clear result is achieved. Then sample the cold water storage tanks, if these results are clear then no further action. If the results are returned positive then clean the cold water storage tanks.

Any detection at the first action level shall cause a thermal disinfection of the calorifier or system followed by a retest and a review of the system and control methods will be carried out. If the retest is positive then the system must be isolated and drained until a chemical clean and disinfection can take place.

If there are detections at the second action level, the Duty Holder must be informed and the system shall be subject to a chemical clean and disinfection. The system must be isolated and drained until a chemical clean and disinfection can take place. The system shall also be reviewed and control methods checked.

6.5 Record keeping

The Duty Holder shall ensure that appropriate records are kept, including details of:

- The person or persons responsible for conducting the risk assessment, managing and implementing the written scheme.
- The significant findings of the risk assessment.
- The written scheme of inspection and details of its implementation.
- The results of any monitoring, inspection, test or check carried out, and the dates. This should include details of the state of operation of the system, i.e. in use/not in use.

Records shall be retained throughout the period for which they remain current and for at least two years after that period. Records kept in accordance with monitoring shall be retained for at least five years.

The following types of records are kept.

Record	Retention Period
This policy and procedures document	Throughout the period for which they remain current and for at least two further years.
Risk assessments	
Risk minimisation scheme and details of its implementation	
Monitoring, inspection, test and check results, including details of the state of operation of the system	At least five years

7 Monitoring Compliance

7.1 Compliance Audits

Any management system, if left alone, will deteriorate over time - where Legionella is concerned this could prove fatal. It is therefore a requirement of this Policy that the Director of Property & Facilities will periodically monitor that this statement remains relevant and effective and will, from time to time, require certain information from the Responsible Person Legionella. This will include (inter alia): copies of statements of local safety statements, risk assessments, maintenance records and other related activities.

The Responsible Person will annually audit the implementation of this Policy to ensure compliance. A written report of the findings of this audit will be held by the Responsible Person – Maintenance Operations Manager.

7.2 Review

Quarterly management review meetings shall be held in order to assess the progress with respect to management issues. These meetings will also assess progress against the action plan in order to identify any problems with the implementation of specific remedial measures.

The Director of Property & Facilities will convene this Control of Legionella Group and invite the Responsible Person and deputies, The Water Testing Consultant and representation from Health & Safety.

7.3 Outbreak/Isolation

As part of the investigation and control of the outbreak, the University must comply with the requests and recommendations given by the relevant enforcing authority. The immediate actions as a minimum will be:

- a) To shut down any processes which are capable of generating and disseminating airborne water droplets and keep them shut down until sampling procedures and any remedial cleaning or other work has been done. Final clearance to restart the system may be required.
- b) To take water samples from the system before any emergency disinfection being undertaken. This will help the investigation of the cause of the illness. The investigating officers from the local authority may take samples or require them to be taken.
- c) To provide staff health records to discern whether there are any further undiagnosed cases of illness, and to help prepare case histories of the persons affected.
- d) To co-operate fully in an investigation of any plant that may be suspected of being involved in the cause of the outbreak. This may involve, for example:
 - Tracing of all pipework runs
 - Detailed scrutiny of all operational records
 - Statements from plant operators and managers
 - Statements from water treatment contractors or consultants

8 Further Guidance

The University's recommended standards to be held in this policy have been prepared on the interpretation, understanding and practical application of legal requirements in conjunction with the following guidelines and legal documents:

- HSE Approved Code of Practice ACOP L8 (rev) – “The control of Legionella bacteria in water systems”.
- BS 6700 – “Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages”.
- BS 1710 – “Specification for the identification of pipe-lines and services”.
- Health and Safety at Work Act
- Control of Substances Hazardous to Health Regulations
- Water Supply (Water Fittings) Regulations
- Water Supply (Water Quality) Regulations
- The Notification of Cooling Towers and Evaporative Condensers Regulations
- CIBSE's guidance minimising the risk of legionnaires disease

Appendix 1 – Summary of Planned Maintenance Requirements

Service	Task	Frequency
Hot water services	Arrange for samples to be taken from hot water calorifiers, in order to note condition of drain water.	Annually
	Check temperatures in flow and return at calorifiers.	Monthly
	Check water temperature up to one minute to see if it has reached 50°C in the sentinel taps.	Monthly
	Visual check on internal surfaces of calorifiers for scale and sludge. Check representative taps for temperature as above on a rotational basis.	Annually
Cold water services	Check tank water temperature remote from ball valve and mains temperature at ball valve. Note maximum temperatures recorded by fixed max/min thermometers where fitted.	Six Monthly
	Check that temperature is below 20 °C after running the water for up to two minutes in the sentinel taps.	Monthly
	Visually inspect cold water storage tanks and carry out remedial work where necessary. Check representative taps for temperature as above on a rotational basis.	Annually
Shower heads	Dismantle, clean and descale shower heads and hoses.	Quarterly or as necessary
Little used outlets	Flush through and purge to drain, or purge to drain immediately before use, without release of aerosols.	Weekly