Mobile: 07588 045914 **Tel:** 01639 262001 **Fax:** 01639 262000
Email: info@morganenvironmental.co.uk **Website:** www.legionellacontrolwales.co.uk
Company Address: Units 40, 41, A1 & 51 Port Talbot Business Units,
Addison Road, Port Talbot SA12 6HZ

LEGIONELLA RISK ASSESSMENT FOR

Caldicot Town Council Cyngor y Dref Cil-y-Coed

CALDICOT TOWN COUNCIL OFFICES

Client	Caldicot Town Council
Site Address	Sandy Lane, Caldicot, NP26 4NA.
Risk Assessment (RA) Date	10TH August 2026
Site Contact	Mr Bob Shillabeer (Caldicot Mayor)
Risk Assessor	Mr Peter Jones – Morgan Environmental Ltd.
Assessment checked by	Mr Carl Willis – Morgan Environmental Ltd
Previous RA Date	No previous assessment seen.
Assessment Review Frequency	Review the risk assessment regularly and particularly when there is reason to suspect it is no longer valid. For best practice Morgan Environmental Ltd. recommends that this assessment should be reviewed 2 yearly or sooner if deemed necessary

Mobile: 07588 045914 **Tel:** 01639 262001 **Fax:** 01639 262000
Email: info@morganenvironmental.co.uk **Website:** www.legionellacontrolwales.co.uk
Company Address: Units 40, 41, A1 & 51 Port Talbot Business Units,
Addison Road, Port Talbot SA12 6HZ

REF.	SECTION	PAGE
1 1.1	**INTRODUCTION** Brief introduction to Legionella bacteria and relevant legislation	**3**
2 2.1 2.2 2.3	**RISK EVALUATION** Site & Water Systems Overview Summary of Identified Risks Overall Risk Scoring	**8** **10** **15**
3	**SCHEMATICS** Drawings of the water systems present on site	**18**
4 4.1 4.2 4.3	**MANAGEMENT RESPONSIBILITIES** Management and Personnel Selection Facilities Management or Water Hygiene Company Training Level Identified	**19** **22** **23**
5 5.1 5.2 5.3	**RECOMMENDATIONS** Remedial works and additional control measures considered necessary to minimize the risk of proliferation and infection. Control Scheme – Physical Control Scheme – Management Control Scheme – Monitoring	**24** **25** **27**
6	**SURVEY DATE COLLECTION** Survey reports of the main component parts of the system. An asset register of services associated with the water systems on site and where applicable their water temperatures including sentinel testing points	**29**
7	**REVIEW OF CONTROL MEASURES**	**36**
8	**PHOTOGRAPHS** Evidence of systems and structural conditions on site	**42**
9	**APPENDIX** Risk assessment associated documentation	**44**

1 Introduction

1.1 Legionella bacteria and relevant legislation

What is Legionnaires' disease?

1) Legionnaires' disease is a type of pneumonia. It was named after an outbreak of severe pneumonia that affected a meeting of the American Legion in 1976. It is an uncommon but serious disease.
2) It is actually one of a group of similar diseases collectively known as Legionellosis. The other forms, e.g. Pontiac Fever and Lochgoilhead Fever, have similar symptoms but are not as serious as Legionnaires' disease.
3) Legionnaires' disease occurs more frequently in men than women. It usually affects middle-aged or elderly people, and it more commonly affects smokers or people with other chest problems.
4) About half the cases of Legionnaires' disease are caught abroad, and useful advice on travel can be obtained from the European Working Group for Infections (EWGLI). The other half are the result of infections acquired in the UK.

How do people get it?

5) The agent that causes Legionnaires' disease is a bacterium called **pneumophila**. People catch Legionnaires' disease by inhaling small droplets of water suspended in the air, which contain the bacteria.
6) Certain conditions increase the risk from:

   - a suitable temperature for growth, 20 to 45°C;
   - a source of nutrients for the organism, e.g. sludge, scale, rust, algae, and other organic matter, and:
   - a way of creating and spreading breathable droplets, e.g. the aerosol created by a cooling tower or spa pool.

   However, remember that most people exposed to Legionella do not become ill, and Legionnaires' disease does not spread from person to person.

What are the symptoms?

7) The symptoms of Legionnaires' disease are similar to those of flu:

   - high temperature, fever and chills;
   - cough;
   - muscle pains; and
   - headache.

   In a bad case, there may also be pneumonia, and occasionally diarrhoea and signs of mental confusion.

Where does it come from?

Bacteria are widespread in nature, mainly living in natural water systems, e.g. rivers and ponds. However, the conditions are rarely right for people to catch the disease from these sources.

8) Outbreaks of the illness occur from exposure to growing in purpose-built systems where the water is maintained at a temperature high enough to

encourage growth, e.g. cooling towers, evaporative condensers, spa pools and hot water systems used in all sorts of premises (work and domestic).

9) Most community outbreaks in the UK have been linked to installations such as cooling towers, which can spread droplets of water over a wide area. These are found as part of air-conditioning and industrial cooling systems.

10) Fatal cases of Legionnaires' disease have also been associated with spa pool demonstrations.

What measures are there to control?

11) To prevent exposure to the bacteria, you as a duty holder must comply with legislation that requires you to manage, maintain and treat water systems in your premises properly. This will include, but not be limited to, appropriate water treatment and cleaning regimes.

12) Remember, Legionella can grow in any workplace if the conditions are right - you do not have to work with microbiological agents, e.g. in a laboratory, for exposure to occur. If you are responsible for any of the water systems described in HSE's Approved Code of Practice (ACoP) and Guidance "Legionnaires' disease: The control of bacteria in water systems" (L8) you will need to assess the risk of employees and others in the workplace contracting Legionnaires' disease.

13) Copies of L8 can be purchased or downloaded from HSE Books. HSE also publishes several free leaflets and a video explaining legal duties and the control of Legionella in cooling systems and hot/cold water systems available from HSE Books.

14) Separate regulations (The Notification of Cooling Towers and Evaporative Condensers Regulations 1992) require the notification of cooling towers to your Local Authority (contact them directly for further information).

What to do if you or an employee has Legionnaires' disease

15) If you suspect that you or an employee have contracted the disease as a result of your work, then there is a legal requirement to report cases the Health and Safety Executive.

16) L8 gives advice on actions to take in the event of finding Legionella in your workplace and also during an outbreak.

Further Information

If you are responsible for premises inspected by your Local Authority you should direct any queries about in your workplace to them initially or contact the HSE Infoline on 0845 345 0055.

Risk Assessment

A suitable and sufficient assessment must be carried out to identify and assess the risk of exposure to legionella bacteria from work activities and water systems on the premises and any precautionary measures needed.

This risk assessment is to provide a working document that has assessed the risk(s) of Legionella bacteria within the water systems contained on this site.
By carrying out the survey and assessment compliance is being met with the:

- **Health Technical Memorandum 01-05: Decontamination in Primary Care Dental Practices (HTM01-05)**

- **Health Technical Memorandum 04-01: The control of Legionella, hygiene, "safe" hot water, cold water and drinking water systems (HTM04-01)**

  which in turn satisfies the requirements under the:

- **Health and Safety Executive Approved Code of Practice and Guidance - (L8) 2013 "Legionnaires' Disease: the control of bacteria in water systems"**
- **Health and Safety Executive Technical guidance (HSG 274) Part 1: The control of legionella in evaporative cooling systems.**
- **Health and Safety Executive Technical guidance (HSG 274) Part 2: The control of legionella in hot & cold-water systems.**
- **Health and Safety Executive Technical guidance (HSG 274) Part 3: The control of legionella bacteria in other risk systems. (where applicable)**
- **Health and Safety at Work Act 1974.**
- **The Management of Health and Safety at Work Regulations 1999.**
- **The Control of Substances Hazardous to Health Regulations 2002 (as amended)**
- **Water Supply (Water Fittings) Regulations 1999**
- **BS 8580-1:2019 Water quality. Risk assessments for Legionella control. Code of practice**
- **Health and Safety Executive Technical guidance (HSG 272): The control of legionella and other infectious agents in spa-pool systems**

The purpose of the assessment is to enable a valid decision to be made regarding:

1. The risk to health, i.e. whether the potential for harm to health from exposure is reasonably foreseeable unless adequate precautionary measures are adopted.

2. What measures for prevention or adequate control to minimise the risk from exposure to legionella bacteria should be taken.

3. Identification and evaluation of potential sources of risk and the particular means by which exposure to legionella is to be prevented, or If prevention is not reasonably practicable, the particular means by which the risk from exposure to Legionella is to be minimised.

The risk assessment also enables the person who holds the title of statuary duty holder to show they have considered all the relevant factors, and the steps needed to prevent or control the risk have been identified.

INTRODUCTION TO HSC ACOP L8, NOVEMBER 2013

This Approved Code of Practice (ACOP) gives advice on the requirements of the Health and Safety at Work etc. Act 1974 (the HSW Act)[1] and the Control of Substances Hazardous to Health Regulations 2002 (COSHH)[2] and applies to the risk from exposure to legionella bacteria (the causative agent of legionellosis, including Legionnaires' disease). In particular it gives guidance on sections 2, 3, 4 and 6 of the HSW Act and regulations 6, 7, 8, 9 and 12 of COSHH. The Code also gives guidance on compliance with the relevant parts of the Management of Health and Safety at Work Regulations 1999 (the Management Regulations).[3]

This fourth edition of the ACOP and guidance on regulations contains revisions to simplify and clarify the text. The main changes are:

Removing Part 2, the technical guidance, which is now published separately at www.hse.gov.uk/pubns/books/hsg274.htm and has three parts: *Part 1: Evaporative cooling systems; Part 2: Hot and cold-water systems* and *Part 3: Other risk systems*;

The Approved Code of Practice (ACoP) places responsibility on employers and others to:

1. Identify and assess sources of risk
2. Appoint a competent person, known as the 'responsible person.
3. Prepare a scheme for preventing or controlling the risk
4. Implement and manage precautions
5. Keep records of the precautions implemented
6. Identify persons responsible for the management and implementation of any schemes for prevention/controlling risk.
7. Ensure designers, manufactures, importers & suppliers of articles or substances are safe, and don not pose risks to health at work.

Where the assessment shows that there is a reasonably foreseeable risk of exposure to legionella bacteria, the use of water systems, parts of water systems or systems of work that lead to exposure must be avoided so far as is reasonably practicable. Where this is not reasonably practicable, there should be a written scheme for controlling the risk from exposure that should be properly implemented and managed.

"To carry out a duty **so far as is reasonably practicable** means that the degree of risk in a particular activity or environment can be balanced against time, trouble, cost and physical difficulty of taking measures to avoid the risk. If these are so disproportionate to the risk that it would be unreasonable for the people concerned to have to incur them to prevent it, they are not obliged to do so. The greater the risk, the more likely it is reasonable to go to very substantial expense, trouble and invention to reduce it. But if the consequences and extent of a risk are small, insistence on great expense would not be considered reasonable. It is important to remember that the judgement is an objective one and the size or financial position of the employer, are immaterial".

"**So far as is practicable,** without the qualifying word 'reasonably', implies a stricter standard. This term generally embraces whatever is technically possible in the light of current knowledge, which the person concerned had or ought to have had at the time. The cost, time and trouble involved are not taken into account".

These two definitions are not defined in the HSW Act and ultimately, it will be for the courts to decide their application in particular cases.

Record Keeping

The person or persons to take managerial responsibility should ensure that appropriate records are kept, including:

1. Names and positions of persons on whom the statutory and managerial duty falls.
2. The assessment of risk.

3. Name, position and person or persons who carried out the assessment.

4. A written scheme to minimise the risk.

5. The names of persons responsible for implementing the scheme.

6. Records of operation and non-operation of plant and services.

7. Training levels of personnel involved in managing the risk.

A record should also be kept of the implementation of the written scheme, which should include the following:

1. Details of precautionary measures carried out.

2. Results of inspection, tests and checks carried out.

3. Remedial work required and carried out.

4. Reviews of control measures

All tasks should include the signature of the person carrying out the task and the date.

Records should be preserved throughout the period for which they remain current and for at least five years thereafter.

Review of the Risk Assessment

The record of the assessment is a living document that must be reviewed to ensure it remains up-to-date. Arrange to review the assessment regularly and specifically whenever there is reason to suspect it is no longer valid. An indication of when to review the assessment and what to consider should be recorded. This may result from, e.g.

1. Changes to the water system or its use

2. Changes to the use of the building in which the water system is installed

3. The availability of new information about risks or control measures

4. The results of checks indicating that control measures are no longer effective

5. Changes to key personnel

6. A case of legionnaires' disease/legionellosis associated with the system.

IMPORTANT NOTES

Information contained in the document is based on the conditions found and information supplied during the site survey and assessment visit on the date(s) specified. Whilst every effort has been made to identify all pipework, we cannot accept any responsibility for any omissions due to system complexity and limited information/access.

This assessment is based on information provided by site including verbal statements, any relevant plans, explanations regarding operations & usage etc., & only includes areas made known to this assessor whilst onsite.

2 Risk Evaluation

2.1 Site & Water Systems Overview

Type of System / Component	Present	Details
Mains water supply to site:	✓	*A Local Water Authority mains enters the building in the office pillar.*
Cold water storage tanks:	X	
Calorifiers / hot water cylinders >15 litres	X	
Point of use electric water heaters 15 litres or less	✓	*1x POU local water heater located in the reception with associated expansion vessel.*
Instantaneous water heaters	✓	*1x combi boiler located in the rear store room*
Combination water heaters	X	
Expansion / accumulator vessels	✓	*1x expansion vessel is fitted to POUH01*
Showers or outlets with spray fittings:	X	
Emergency showers & eye wash	X	
TMV's (thermostatic mixing valves) / TMT's (thermostatic mixing taps)	✓	*3x TMV's, one located in each toilet*
Water softeners:	X	
Air handling units (with cooling coils):	X	
Air humidification plant:	X	
Closed heating / chilled water systems:	✓	*LPHW heating system supplied by a filling loop connection.*
Evaporative cooling systems	X	
Dental equipment:	X	
Other water systems:	X	
Primary method of legionella control		None
Date of any major refurbishment		**Office water system and assets have recently all been updated, no further refurbishment planned.**
Any limitations of whilst conducting risk assessment		This assessment was non-intrusive based on what was shown by designated site contacts. Service voids were not accessed during this assessment.
Has an outbreak of legionnaires' disease been associated with the systems present		No

Legionella Risk Assessment

Brief description of site & water services:
The Caldicot council offices are in single floored Bungalow type of building and is a relevantly new build and was purpose built for the council, the building consists of Reception area for local community to visit, meeting rooms, council staff offices, store rooms, accessible toilet and Male/Female toilets. The offices are open from 11am till 3pm, the building holds council meetings and has variety of purposes for the local community, the building is situated close to the Caldicot town centre, with a Children's nursery next door no hospitals or cooling towers are located in the nearby vicinity. The offices are mains water fed to all cold-water outlets and assets. Site has 1x Combi gas boiler that feds the majority of hot outlets, including the store area sink, the office sink, the accessible toilet with has a TMV on the hot outlet, the Female toilet that also has a TMV blending the hot water to prevent scalding and the male toilets also with a TMV fitted. The front reception area has a sink which has hot water supplied by a single Point of Use Water Heater. The Office and reception both have boiled and chilled water units under the sinks, which have outlet over sinks for boiled water for drinks and chilled drinking water. The offices can have up to 10 staff personal working and multiple visitor. Site have a jet washer for cleaning and washing down from outside tap, tap water is also used to fill a mobile bowser which is used to water towns flowers (baskets and beds)
Sources of Information present at time of the assessment: Assessor was verbally given information on building from council staff.

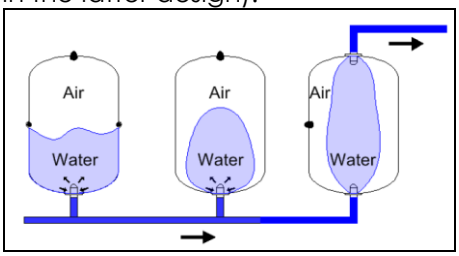
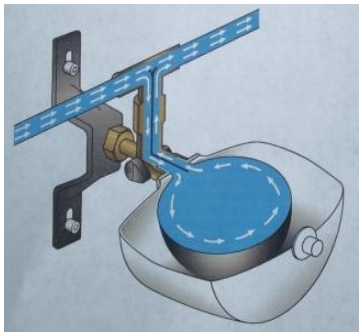
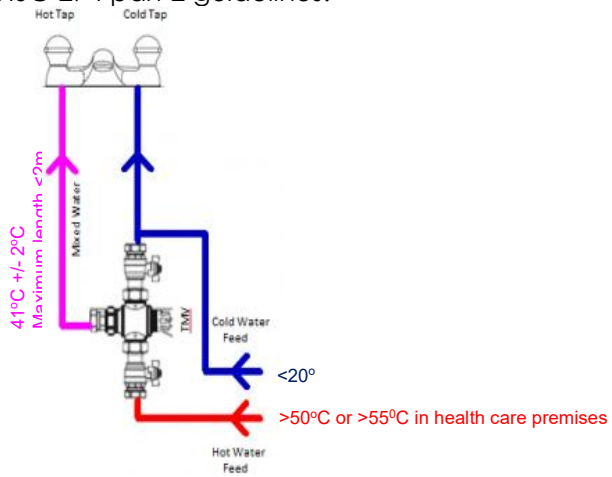
2 Risk Evaluation

2.2 Summary of Identified Risks

CRITERIA	SUMMARY OF RISKS
Population Susceptibility	The council offices are used by council members and staff, which are made up of 50/50 male and female. Staff will have a typical age range of 18 – 65, generally a moderate risk group with regard to legionella susceptibility. Visitors and contractors using the water services are also likely to be classed as a moderate risk group. People from the local community will be of different ages and genders. those individuals at most risk are people over the age of 45, smokers, heavy drinkers and anyone with a suppressed immune system. The assessor cannot know if people visiting site are at high-risk from Legionellosis.
Legionella Control Management & Written Scheme	The legionella management was generally found to be in poor order and is to be improved of the back of this assessment. Legionella management information and previous risk assessments weren't present. There are no personnel involved in legionella monitoring with the requirements of L8 and HSG 274 Part 2. Training certificates are not available. Generally, the management was found to be poor with no system in place to control risks. The current legionella management system is effective and should be improved. There is no written scheme in place for the control onsite. Legionella awareness training has not been undertaken for the personnel directly involved with monitoring, inspection and maintenance. Ideally, copies of certificates should be held in the logbook or be signposted. The existing legionella management programme has been effective / ineffective to date The SDH **To Be Confirmed** need to ensure that all personnel involved are fully aware of their responsibilities and that records are clear to show all tasks are carried out in accordance with L8 and HSG 274 part 2. Please reference Section 4.3 for a detailed breakdown of the ongoing management requirements.
Monitoring & Record Keeping	Relevant monitoring and maintenance documentation that should be made available; The documentation represent the system and all monitoring tasks that should be carried out. a) Appropriate POU Water heater hot water temperatures b) TMV annual maintenance records c) Expansion vessel/s routine flushing and maintenance. d) Appropriate records for weekly flushing of infrequently used outlets. e) Any other plant and equipment monitoring and routine maintenance records. Improvements can be adopted to improve the current reporting of faults and ongoing physical maintenance by using the logbook to record: a) Any out of parameter temperatures should be highlighted and refer to defect/action log entries. Reference Section 5.3. for a detailed breakdown of all monitoring requirements specific to this building.

Hot Water Storage <15 L	1x local water heater (15 litres capacity) with associated expansion vessel is located in the reception area. Ideally the output temperature should be set at 50˚C – 60˚C and all outlets should attain >50˚C within one minute of flow unless they are used frequently, ie. daily to minimise legionella colonisation risk. Low-Capacity Water Heaters (LCWH) with <15ltres capacity are generally seen as low risk due their high turnover.
POU Instantaneous Water Heaters	There is an instantaneous gas fed water heater (CGB01) located in the rear sore area. The CGB01 IS used frequently. The output temperatures were found to be satisfactory at time of visit. Please refer to section 6.1 for details. Water heaters of this type are generally considered to be low risk as they do not store water. Providing they are used frequently and/or output at >50˚C.
Cold Water Storage	There are no CWST's located on site.
Dead Ends / Legs & Infrequently Used Outlets	There were operational dead legs identified at the time of survey associated with filler loop. Other dead legs were identified which are noted in section 6.4. Ideally appropriate actions should be taken to minimize the risk from stagnating water that may be present. Should any outlets become infrequently used then outlets should be flushed on at least a weekly basis, without the generation of spray. Any pipework not receiving regular flow may result in water stagnation and will promote bacterial proliferation.
Spray Generation	Spray taps aren't present. Also, it should not be ignored that there is potential for spray formation via water impacting on the sinks / basins. Scale deposition to outlets can also aid spray formation and potentially provide a breeding ground for bacteria.
Temperature Control	The mains cold water service temperatures were unsatisfactory at >20°C, which doesn't comply with HSG 274-part 2 guidance. This is due to the rise in the warmer weather temperatures we are experiencing, which is thermally warming the incoming mains. Hot water temperatures to site were satisfactory with hot outlets supplied by the water heaters achieving >50°C (55°C in health care premises) within a minute.
Backflow / Thermal Cross Over	There is potential for unintended backflow and thermal crossover within the hot and cold-water systems, particularly at Thermostatic Mixing Valves (TMVs), calorifier feeds, and associated pipework. There are a number of TMVs installed across site which may present a risk of thermal crossover if left unmanaged. This can occur due to failed or missing non-return valves, pressure imbalances, scale build-up, or internal TMV component failure, allowing hot and cold water to mix upstream of the outlet. Routine TMV inspection, servicing, and temperature verification will reduce the likelihood of thermal crossover and help ensure that hot and cold-water systems remain hydraulically separated and operate within required temperature parameters. Thermal crossover may also occur at calorifier cold water inlets, secondary hot water return connections, and central blending valves, particularly where non-return valves fail or pressure imbalances exist. This can compromise temperature control and increase Legionella risk if not effectively managed.

Water Filters	Water filter supplies the two chilled and boiled water units . There was no record for service visits, service records should be recorded and logged in book. Water filter should be routinely changed inline with the manufacturer's instructions.
Union bib taps	The Outside bib tap is not fitted with a backflow protection device (double check valve) as per water fittings regulations to prevent potential contamination when hoses are fitted.
Hose pipes	There are hose pipes used on the outside tap which can attached to outside bib taps for various purposes, mainly for washing down, watering. Some hose pipes are attached to jet washer. There have been incidences of legionella outbreaks originating from garden hose pipes. Hose pipes left full of water and exposed to direct sunlight can provide conditions for microbiological proliferation. When attached to spray/aerosol generating devices such as sprinklers, pressure washers and spray heads the contaminated aerosol can enter the lungs of people in immediate vicinity and downwind of the device. This potentially contaminated water can harbour legionella bacteria and those with high susceptibility are at particular risk to contracting legionnaire's disease and other legionella associated diseases. In addition, there is a potential risk of scalding through summer months where if hoses are left in the sun the water within them can heat up to scalding temperatures. This would pose a risk especially if the initial water sprayed from the hose is not used in not the correct manner i.e. for fun and not its intended purpose. Ensure if hoses are not removed, they are flushed to drain before use. The hose pipe should be disconnected from the bib tap when not in use and fully drained. Flush the hose pipe without creating spray prior to use.
Flex hoses	Flexible hoses were found to be fitted at the majority of services. Concerns had been raised by hose and tap manufacturers, health authorities, scientists and plumbing installers regarding the effects of the materials used for some flexible hoses on the quality of water intended for drinking or other domestic purposes. The concerns include the possibility that these materials may encourage the growth of bacteria which can be harmful to health, especially the Legionella bacterium which causes Legionnaires' disease. Flexible hoses as a minimum must be WRAS approved or where practice replaced with fixed pipework tails.
Pressurised Accumulators / Expansion Vessels	The low-capacity water heaters is fitted with pressurised expansion vessel which if not managed correctly pose a risk of bacteria breeding. In addition, the expansion vessel is not fitted with a drain valve for maintenance. Accumulators / expansion vessels in systems operating at steady temperature and pressure may have long periods without exchanging any significant amount of water and therefore can be at risk of aiding microbial growth. Where water is boosted via pumps, hydraulic accumulators / expansion (pressurised vessels that buffer variations in pressure so acting like a shock absorber) are often used to reduce pressure surges from the pumps and may reduce the demand frequency. When correctly installed, hydraulic accumulators will partially fill and empty between each pump run and should exchange water at regular intervals, which will reduce the risk of stagnation. In pressurised systems, a means of accommodating water expansion (caused by the water heating) is required. This is often achieved with the use of an expansion vessel however, these may not fill and empty where the system pressure and temperature remains steady.

	There are several types of vessel available including diaphragm or bladder type, with fixed and interchangeable (replaceable) bladders, as shown below. These internal bladders are often made of synthetic rubber and may support the growth of microorganisms including legionella so these must be confirmed to comply with BS6920. Vessels with a 'flow through' design should provide less opportunity for water to stagnate and become contaminated (as in the latter design).  Where flow through vessels are not fitted the vessel should be ideally fixed vertically with an anti-legionella valve. The Anti-legionella valve converts a standard single connection expansion vessel into a 'flow through' type. It does this by diverting a portion of the flow into the vessel so that the water content is continually renewed.  If this is not practicable then drain valves should be fitted at point of branch and the vessel must be routinely flushed.
Thermostatic Mixing Valves (TMV's)	TMV hot water inlets should be monitored to ensure the HWS is >50°C within 1 minute (55°C in health care premises) & cold-water inlets <20°C after 2 minutes. 2x TMV's were found to be outside of the recommended range of +/- 2 degrees of 41°C. Currently the TMV's are not routinely serviced as per HSG 274 part 2 guidelines. Filters are not removed and cleaned & disinfected. There were not any records witnessed for the routine serving of TMV's as per HSG 274 part 2 guidelines. 

Insulation	Hot and cold distribution pipe work has not all been insulated. HSG 274-part 2 guidance requires hot and cold pipe work to be adequately insulated to minimise heat loss and heat gain.
Scale Deposition on Outlets	Scale deposits were present. The presence of scale provides a nutrient source for bacteria and can aid in its proliferation. Routine de-scaling & cleaning can minimize the risk of scale formation.
WC Toilet Cisterns	There has been evidence demonstrate that aerosols from WC's flushes in particular can spread to the immediate area and if contaminated with legionella bacteria potentially have a detrimental impact to anyone in close proximity of the WC. Closing of toilet lids to minimise the spread of aerosols generated is recommended when flushing.
Closed Water Systems (Heating & Chilled)	The closed water systems on site will normally pose little to no risk with regard to legionella control. However, care should be taken when carrying out maintenance on the system to minimise the risk of generating or releasing any water spray / aerosol. Risks would generally be associated with the MCW pipework supplying the pressurisation unit / filling loop connection / feed and expansion tank, as draw off from supplying pipework may well be infrequent and can create an operational dead leg; see section 6.4. for further specific details/recommendations.
Water Boilers (Hydroboil / Zip)	There are water boilers that supply boiler taps with hot water and cold water for drinks. They have integral cartridge filters which should be routinely changed. The digital display panel indicates when they require changing. One of the water boilers indicated the filter should be changed (in the 10th floor canteen). A responsible person should be designated for this task. Actions should be recorded or sign posted a legionella log book. The units should be maintained in accordance with manufacturer's instructions.

2 Risk Evaluation

2.3 Overall Risk Scoring

The following categories used for risk analysis have been established with reference to the British Standard BS8580-1:2019 Water Quality - Risk Assessments for legionella control - Code of practice.

System Risk Considerations:
The risk factors listed below are those which are associated with the potential chain of events which could result in the infection of a human by legionella bacteria. Each of these aspects must be considered in any risk assessment process where legionellosis is a potential:

	HIGH	MEDIUM	LOW
Contamination: the potential for legionella bacteria and sources of nutrient to enter the water system:	Water is supplied from an uncontrolled source; and/or parts of the system will allow the ingress of contaminants through backflow or direct ingress	Some parts of system are likely to allow ingress of contaminants	There is very little likelihood for the ingress of contaminants
Amplification: Appropriate physicochemical conditions for the growth of legionella and their supporting organisms, including a presence of nutrients	Water temperatures are commonly between 20°C and 50°C; blind ends present; biofilm, scale, rust and other nutrients present; evidence of stagnation	Some evidence of nutrients present; temperatures borderline; suspected stagnation or stratification	System clean and well designed, temperatures consistently outside of 20°C and 50°C range; biocidal control system in place and effective
Transmission: the generation of water droplets which may be inhaled, and opportunities for water to enter the lung	Dissemination of water regularly occurring from via of showers, spray nozzles and other devices	Water is sprayed and/or splashed regularly from taps and other devices	Very few, if any, causes of water droplet formation
Exposure: the proximity of people to the water transmission source	People are regularly exposed with close proximity to water exiting the system	People are occasionally exposed to water exiting the system; or are not within immediate proximity (includes closed systems that are opened for cleaning and maintenance)	People are infrequently exposed to water from the system, or the system is in a remote location
Host Susceptibility: the susceptibility of the resident, working or visiting population to infection	Patients with diseases, or are receiving therapy that reduces immunity; people over 65yrs old; neo-natal babies; heavy smokers	Persons of reasonable health, including those between 45yrs and 65yrs old	Persons of good health generally less than 45yrs old

Legionella Risk Assessment

INHERENT RISK			
The risk rating given for **inherent** risk identifies the level of risk that exists to the exposed population from the artificial water system(s) present, irrespective of whether any action has been taken to control it. In order to understand the inherent risk of a system, it is assumed that the system will at some point be inoculated with legionella bacteria if left unmanaged. The inherent risk rating given below for this site, building or system has been given upon completion of the survey			
INHERENT RISK LEVEL	**HIGH**	**MEDIUM**	**LOW**
Contamination Potential		**X**	
Amplification Potential		**X**	
Transmission		**X**	
Exposure		**X**	
Host Susceptibility		**X**	
CURRENT RISK			
The risk rating given for **current** risk identifies the level of risk that exists to the exposed population from the artificial water system(s) present at the time of conducting the legionella risk assessment. In order to understand the current risk of a system, it is assumed that the system/s may at some point be inoculated with legionella bacteria no further remedial recommendations & ongoing controls are not instigated. The current risk rating given below for this site, building or system/s has been given upon completion of the survey			
CURRENT RISK LEVEL	**HIGH**	**MEDIUM**	**LOW**
Contamination Potential		**X**	
Amplification Potential		**X**	
Transmission		**X**	
Exposure		**X**	
Host Susceptibility		**X**	
TARGET RESIDUAL RISK			
The rating for **residual** risk identifies the level of risk that exists (and is achievable) to the exposed population once the recommendations contained within the risk assessment report have been actioned, including the implementation of remedial works, and control measures - the target being to achieve the lowest level of risk in all factors. It may be likely that some of the recommendations will not be undertaken due to financial or other pressures and therefore the absolute residual risk may not be entirely achieved. It is the **duty of the Responsible Person** to understand and manage the effective residual risk in accordance with the written scheme for legionella control.			
TARGET RISK LEVEL	**HIGH**	**MEDIUM**	**LOW**
Contamination Potential			**X**
Amplification Potential			**X**
Transmission		**X**	
Exposure		**X**	
Host Susceptibility		**X**	

For guidance on achieving target residual risk levels, please refer to the specific recommendations for remedial works and control measures contained in this risk assessment report.

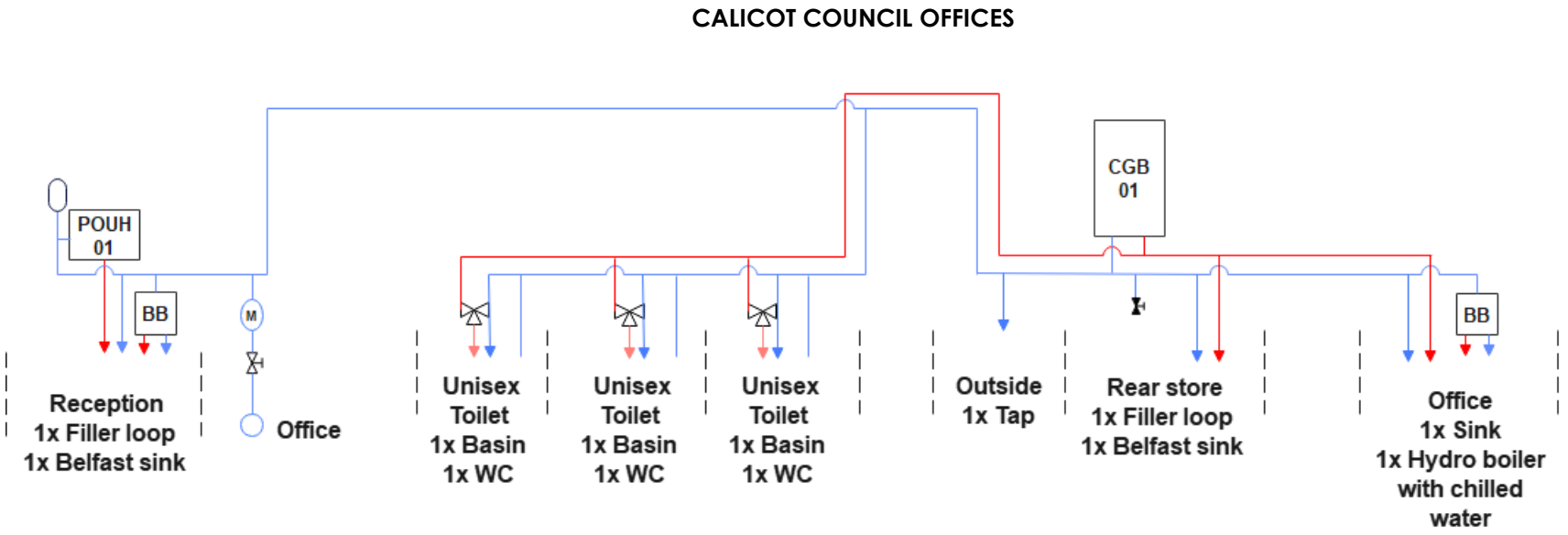
Management Risk Considerations:
Management of the scheme to control the risk is essential to minimise a case our outbreak of legionellosis and to maintain a level of compliance with statutory and moral obligations. This aspect cannot be overlooked when assessing the risk and areas for improvement must be considered:

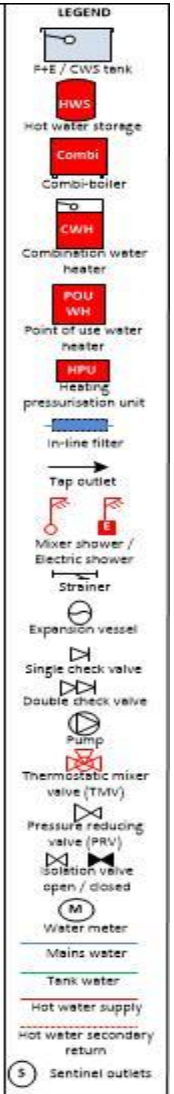
	HIGH	MEDIUM	LOW
Management: the arrangements for managing the risk, including appointments, clarity of responsibilities, competence, and record keeping	No formal management arrangements are in place; poor understanding of risk and responsibilities; little of no record keeping	Unclear or out of date management arrangements; limited knowledge or understanding; record keeping could be improved	Clear lines of responsibility; adequate levels of competence at all levels; good records

For guidance on achieving the essential **low risk level,** please refer to the specific recommendations for management and training contained in this risk assessment report	LOW	MEDIUM	HIGH
MANAGEMENT RISK LEVEL IDENTIFED DURING THIS LEGIONELLA RISK ASSESSMENT			**X**

3 Schematics of Water services

Simple schematics of the current water systems and services where required have been produced for this assessment.
These do not substitute for engineering drawings but give **Caldicot Town council** an understanding of how the systems and services to the best of our knowledge and experience are designed.





Unit 51 Port Talbot Business Units
Addison Road, Port Talbot
SA12 6HZ
Mobile: 07588 045814
Tel: 01639 262001
Email: info@morganenvironmental.co.uk
Website: www.legionelacontrolwales.co.uk

Schematic Drawing of Domestic Water Services

Drawn by: PJ
Drawing no: 1
Issue: 1

Note: This schematic drawing does not substitute an Engineering drawing. Some assumptions may have been made for connections on hidden pipework and for ease of representation.
Whilst every effort has been made to identify all pipework, we cannot accept any responsibility for any omissions due to system complexity and limited information or access.
NOT TO SCALE

4 Management Responsibilities

4.1 Management and Personnel Selection

The person on whom the statutory duty falls upon should appoint a person or persons to take managerial responsibility for the implementation of precautions. They should have the ability, experience, instruction, information, training and resources to allow them to carry out their tasks competently and safely. In particular, they should know potential sources and the risks they present, measures to be adopted, including precautions to be taken for the protection of people concerned ensuring control of an effective regime and its significance.

Duty Holder

Has overall responsibility to ensure that the policy for the management and control of Water Quality, Legionella and Associated Risks is implemented and that suitable and sufficient resources are made available to discharge any requirement associated with the same.

In practice the Duty Holder will delegate day-to-day implementation to the Nominated Person (Water Quality and Legionella) who in turn delegates this responsibility to the Responsible Person. However, the Duty Holder will retain the duty of appointing the Nominated Person (Water Quality and Legionella).

Responsible Person

In a Legionella control context, the term "Responsible Person" is identified in the HSE's Approved Code of Practice & Guidance document L8 as someone with day-to-day responsibility for controlling any identified risk from Legionella bacteria. The appointed "Responsible Person" should be a manager, director, or have similar status and sufficient authority, competence and knowledge of the installation to ensure that all operational procedures are carried out in a timely and effective manner. They should also have a clear understanding of their duties and the overall health and safety management structure and policy in the organisation.

"***Job description***"

Job Title: Responsible Person - Legionella Management

Reporting to: Duty Holder

Key objectives

To ensure that all water systems on site are fully compliant with all aspects of Legionella legislation:

1. Health and safety at work act 1974
2. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)
3. Control of Substances Hazardous to Health Regulations 2002
4. Management of Health and Safety at Work Regulations 1999
5. Water fittings regulations 1999

Secondary objectives

To ensure effective communication at all times with the "Duty Holder" regarding all aspects of the Legionella risk management programmed.

To ensure effective communication and management of all staff involved in the Legionella risk management programmed, thus effecting full execution of any written scheme of precautions necessary to minimise the risk of Legionella proliferation in the areas under their control.

To recruit and ensure that all staff have the correct levels of competence and training suitable for their appointed roles in the risk management programmed.

To select and appoint service providers, if appropriate, who have the correct level of training and competence to be able to undertake the roles contracted to them.

The "Responsible Person" should have a detailed understanding of the service provider's commitments as detailed in the Legionella Control Associations code of practice if the service provider has the LCA accreditation.

Accountability

The "Responsible Person" should have sufficient authority, competence and knowledge of the installation to ensure that all operational procedures are carried out in a timely and effective manner.

The "Responsible Person" should have a thorough understanding of their duties and the overall health and safety management of the facility, its policies and organisational structure.

Those who are appointed to carry out the control measures and strategies should be suitably informed, instructed and trained and their suitability assessed. They should be properly trained to a standard which ensures that tasks are carried out in a safe, technically competent manner. Regular refresher training should be given, and records of all initial and refresher training need to be maintained. Although training is an essential element of competence, it is not the only factor - it should be viewed as is a product of sufficient training, experience, knowledge and other personal qualities which are needed to undertake a job safely. Competence is dependent on the needs of the situation and the nature of the risks involved.

Legionella Risk Assessment

Company: **Address:**	Caldicot Town Council Sandy Lane, Caldicot, NP26 4NA
Statutory Duty Holder	The Employer or Managing Director is the person on whom the Statutory Duty falls. Suitable persons should be appointed in writing to take managerial responsibility for overseeing the assessment and implementation of precautions. Name – Mr Bob Shillabeer -To Be Confirmed Title - Mayor
Managerial Duty **(The Responsible Person)**	The person for who the managerial responsibility falls should be a Manager, Director or someone who has the authority to ensure that measures are carried out effectively. Name – Ms Maxine Mitcell - To Be Confirmed Title - Deputy Mayor
Deputy 1 **(When the above listed are off site)**	Name - To Be Confirmed Title -
Other site personnel involved in the control scheme	Name - To Be Confirmed Title -

Comments:

Caldicot Town Council need to ensure –

1. The personnel involved in the control of legionella bacteria onsite are officially appointed in writing as well as his/hers deputy, for times when the responsible person is off site. This also applies identifying a nominated persons who will be responsible for managing and carrying out the tasks involved in the legionella control scheme.

2. All lines of communication and management procedures are defined in writing and understood by all concerned.

3. All parties agree to their responsibilities under ACoP L8 and, HSG 274, HTM 01-05, HTM 04-01, HSG 282 (delete where not applicable).

   A decision as to who should be appointed for the above positions is a matter for Duty holder and needs to be confirmed ASAP.

4.2 Facilities Management Or Water Hygiene Company

Water Hygiene Specialist:	**Not appointed**
Address:	
Post Code:	
Telephone No:	
Fax No:	
E-Mail address:	
The person who on behalf of the Water Hygiene Specialist has the responsibility for legionella control measures	
Name:	
Position:	
Telephone No:	
Fax No:	
E-Mail address:	
Mobile No:	
The person who on behalf of the Water Hygiene Specialist is defined as the Deputy to the main contact	
Name:	
Position:	
Telephone No:	
Fax No:	
E-Mail address:	
Mobile No:	

Comments:

1. The employment of contractors or consultants does not absolve the duty holder of responsibility for ensuring that control procedures are carried out to the standard required to prevent the proliferation of legionella bacteria. Organisations should make reasonable enquiries to satisfy themselves of the competence of contractors in the area of work before entering into contracts for the treatment, monitoring, and cleaning of the water system, and other aspects of water treatment and control.

4.3 Training Level Identified

CALDICOT TOWN COUNCIL PERSONNEL				
PERSON(S)	**POSITION**	**RESPONSIBILITY**	**LEGIONELLA TRAINING**	**TRAINING LEVEL**
Mr Bob Shillabeer – To Be Confirmed	Mayor	Duty Holder. To Be Confirmed	No	Personnel need to be adequately trained; Legionella Awareness training is recommended as a minimum. Further comprehensive legionella training should be undertaken by personnel who carry out control scheme tasks.
Ms Maxine Mitcell – To Be Confirmed	Deputy Mayor	Responsible Person To Be Confirmed	Y No	Personnel need to be adequately trained; Legionella Awareness training is recommended as a minimum. Further comprehensive legionella training should be undertaken by personnel who carry out control scheme tasks.
To Be Confirmed		Deputy Responsible Person	Yes / No	
To Be Confirmed		Site Maintenance- Weekly flushing / in-house monitoring	Yes / No	
• **Site personnel need to be adequately trained for their assigned responsibility** • **Legionella Awareness training is recommended as a minimum for all site personnel.** • **Responsible person training should be reviewed for sites with complex hot & cold-water systems.** • **Further comprehensive legionella training should be undertaken by personnel who carry out control scheme tasks**				
FACILITIES MANAGEMENT OR WATER HYGIENE COMPANY PERSONNEL				
PERSON(S)	**POSITION**	**RESPONSIBILITY**	**TRAINING LEVEL**	
None		Legionella monitoring		

Comments:

1 Periodic legionella awareness sessions can be very effective in promoting good practice onsite & are recommended. Seek guidance from the Morgan Environmental or the Water Management Society, Develop Training or other approved service providers regarding such training sessions.

2 All personnel associated with the control of legionnaire's disease onsite require legionella refresher training when deemed necessary or every 2-3 years.

Competence:

The duty holder should ensure that all employees involved in work that may expose an employee or other person to legionella are given suitable and sufficient information, instruction and training. This includes information, instruction and training on the significant findings of the risk assessment and the appropriate precautions and actions they need to take to safeguard themselves and others. This should be reviewed and updated whenever significant changes are made to the type of work carried out or methods used. Training is an essential element of an employee's capability to carry out work safely, but it is not the only factor: instructions, experience, knowledge and other personal qualities are also relevant to perform a task safely.

5 Recommendations

5.1 Control Scheme (A) – Physical

Guidance on risk priorities:

Urgent-priority items should be attended to imminently - ideally within 1 month of the date of survey.	**URGENT**
High-priority items should be attended to as soon as possible - ideally within 2 to 3 months of the date of survey.	**HIGH**
Medium priority items should be attended to within 3 to 6 months of completion of the risk assessment survey.	**MEDIUM**
Low-priority items should be attended to within 12 months of completion of the risk assessment survey. Some items will be for consideration only.	**LOW**

Building Name: Caldicot Council Offices

Hot & Cold Services	Priority	Completion date
Investigate and improve cold water distribution to ensure water is below 20°C within 2 minutes of running, including to supply of mixing devices where fitted. The high temperatures can be put down to the warmer summer months.	**HIGH**	
Remove all dead legs back to spur or implement weekly flushing. See section 6.4.	**MEDIUM**	
Expansion Vessel should be inspected and purged on a quarterly basis and actions documented. Install an isolation point and draining point to allow purging.	**MEDIUM**	
Introduce a documented programme of maintenance of descaling and disinfection for TMVs/TMTs and ensure that "fail safe" checking is part of the maintenance. Document actions.	**MEDIUM**	
A Hoses / pressure jet washer was noted on site, water within the pipe work will stagnate when not in use and provide an environment for legionella bacteria to proliferate. The use of the system also generates aerosol. When not in use disconnect asset from the water supply and drain down completely.	**MEDIUM**	
Fit adequate back flow protection to outside taps to eliminate back contamination in compliance with Water Supply (Water Fittings) Regs 1999.	**MEDIUM**	
Site should ensure the mobile bowser cold water is below 20 °C and no water is left in the cylinder which could stagnate over time, empty all water in pipework as well after use.	**MEDIUM**	
Fit adequate back flow protection to outside taps to eliminate back contamination in compliance with Water Supply (Water Fittings) Regs 1999.	**MEDIUM**	
Consider removal of flexible hoses and use hard pipe where appropriate or at least ensure flexible hoses are WRAS approved or equivalent following Dept. of Health guidance.	**LOW**	
Disconnect quick fill loop to heating system when not in use to eliminate back contamination in compliance with Water Supply (Water Fittings) Regulations 1999.	**LOW**	
Fit signage in WC's to notify building users to close toilet seats before flushing to minimise any potential risk of exposure to contaminated legionella droplets from toilet cisterns.	**LOW**	
Insulate all exposed areas of pipework to avoid heat loss or gain, e.g. hot runs above cold pipework and runs near radiators where applicable.	**LOW**	

5.2 Control Scheme (B) – Management

Management & Training	**Priority**	**Completion date**
Ensure Responsible Person is formally appointed and is adequately trained and competent following guidance in ACOP L8.	**HIGH**	
Ensure Deputy Responsible Person is formally appointed and is adequately trained and competent following guidance in ACOP L8.	**HIGH**	
Ensure other personnel involved in the controlling the risks are formally appointed and are adequately trained and competent following guidance in ACOP L8.	**HIGH**	
Ensure all persons carrying out legionella control, monitoring and other activities are adequately trained and competent following guidance in ACOP L8 & HSG 274-part 1/2/3.	**HIGH**	
Written Scheme	**Priority**	**Completion date**
Ensure a there is a clear definition of allocated responsibilities for all parties involved in all aspects of risk control.	**HIGH**	
Implement or improve controls to ensure they meet the required standards, as detailed in the section entitled 'Control Scheme'.	**HIGH**	
Implement or improve procedures for responding to and taking appropriate action for out of specification results and observations that elevate the level of risk.	**HIGH**	
Implement or improve 'log-book' system or similar means of recording all monitoring, maintenance and other activities relating to the water system(s) present. Records must be kept for 5 years.	**HIGH**	
Give details on how to use and carry out the various control measures and water treatment regimes, including: a. The physical treatment programme – e.g. using temperature control for hot and cold-water systems. b. The chemical treatment programme, including a description of the manufacturer's data on effectiveness, the concentrations and contact time required (where applicable) c. Health and safety information for storage, handling, use and disposal of chemicals. d. System control parameters (together with allowable tolerances); physical, chemical and biological parameters, together with measurement methods and sampling locations, test frequencies and procedures for maintaining consistency. e. Remedial measures to take in case the control limits are exceeded, including lines of communication. f. Cleaning and disinfection procedures. g. Emergency procedures.	**HIGH**	
Describe the correct operation of the water system plant, including: a. Commissioning and recommissioning procedures. b. Shutdown procedures. c. Checks of warning systems and diagnostic systems in case of system malfunctions. d. Maintenance requirements and frequencies. e. Operating cycles – including when the system plant is in use or idle.	**HIGH**	

Legionella Risk Assessment

Include: a. an up-to-date plan showing the layout of the plant or water system, including parts temporarily out of use (a schematic diagram is sufficient) b. a description of the correct and safe operation of the system/s. c. identify precautions to take. d. Implement checks to carry out to ensure the written scheme is effective and the frequency of such checks. e. Detail the remedial action to take if the written scheme is shown to be not effective.	**HIGH**	

5.3 Control Scheme (C) – Monitoring

Local POU Water Heaters (15 litres or less / Instantaneous)	**Frequency**	**Completion Date**
Check water temperatures to confirm the heater operates at 50–60 °C or check the installation has a high turnover.	3 Monthly	
Where practicable flush HWS system expansion vessels through and purge to drain	3 monthly	
Hot & Cold-Water Outlets	**Frequency**	**Completion Date**
Hot water should be stored at >60°C and should reach 50°C across all parts of the hot system and cold water should not exceed 20°C across all parts of the cold system. Where hot water temperatures have been reduced in lieu of supplementary water treatment some of the following tasks may not be relevant, however a comprehensive microbiological sampling regime should be implemented.		
All HWS systems: take temperatures at a representative selection of other points (intermediate outlets of single pipe systems and tertiary loops in circulating systems) to confirm they are at a minimum of 50 °C (55 °C in healthcare premises) to create a temperature profile of the whole system over a defined time period	Annually (Ideally on a rolling monthly rota)	
HWS & CWS systems: When testing TMV fed outlets ensure the hot and cold-water supply temperatures are noted as well as the outlet temperatures. Hot supplies must be >50°C within 1 minute and cold <20°C after two minutes into the TMV's. WHB and showers outlet must be set at 41°C +/- 2°C to minimise the risk of scalding to the user.	Annually	
CWS systems: Take temperatures at a representative selection of other points to confirm they are below 20 °C to create a temperature profile of the whole system over a defined time period. Peak temperatures or any temperatures that are slow to fall should be an indicator of a localised problem.	Annually (Ideally on a rolling monthly rota)	
CWS systems: Check thermal insulation to ensure it is intact and consider weatherproofing where components are exposed to the outdoor environment	Annually	
Infrequently used outlets: Consideration should be given to removing infrequently used showers, taps and any associated equipment that uses water. If removed, any redundant supply pipework should be cut back as far as possible to a common supply (e.g. to the recirculating pipework or the pipework supplying a more frequently used upstream fitting) but preferably by removing the feeding 'T' Infrequently used equipment within a water system (i.e. not used for a period equal to or greater than seven days) should be included on the flushing regime. Flush the outlets until the temperature at the outlet stabilises and is comparable to supply water and purge to drain. Regularly use the outlets to minimise the risk from microbial growth in the peripheral parts of the water system, sustain and log this procedure once started.	At least weekly or twice weekly during reduced usage.	
Clean or replace inline water filters as per manufacturers advice	As Required	
Clean and disinfect taps / inserts	Annually	
Service and clean/disinfect thermostatic mixing valves (TMVs)	Annually	
Ensure appropriate actions are taken during periods of low occupation or temporary closure of the premises	As Required	

Other Risk Systems	Completion Date	Other Risk Systems
Maintain water boilers as per manufacturer's instructions		
Maintain water boiler/chillers as per manufacturer's instructions		
Pressure Washer Lance Washes	**Frequency**	**Completion Date**
Flush supply pipework to washes before use until the temperature at the outlet stabilises and is comparable to supply water and purge to drain.	As Required	
Dismantle clean and descale spray heads and hoses.	3 Monthly	

6 Survey Data Collection

Condition Survey Reports & Asset Register

Condition Survey Reports

The following section contains the condition survey reports for all identified plant located within the buildings premises.

This includes:

6.1 Asset Register & Temperature Monitoring

6.2 Low-Capacity Hot Water Heaters with Storage (15 litres or less)

6.3 Instantaneous Hot Water Heaters

6.4 Pipework Dead ends, Dead legs & Infrequently Used Outlets

6.5 Sentinel Points

6.6 TMV's (Thermostatic Mixing Valves)

Any points of note or results that are out of parameter, are highlighted in red.

6.1 Asset Register & Temperature Monitoring

LOCATION	SYSTEM / SERVICES ITEM NO'S																	TEMPERATURE READINGS (˚C)				
	TOILET	URINAL	SINK	WHB	UNION TAP	WASH HOSE	TMV	TMT	SHOWER	SPRAY NOZZLE	EXPANSION VESSEL	POU WH LOW CAPACITY	POU WH INSTANT	FLEXABLE HOSES	OTHER	HOT SUPPLY FROM	COLD SUPPLY FROM	HOT	MIXED (TMV)	COLD TANK OR MAINS		SATISFACTORY (Y/N)
																				T	M	
Reception area			1								1	1		2	1x Hydro boiler/chiller	POUH01	Mains	60.0			22.4	N
Unisex toilet	1			1			1							2		CGB01	Mains	53.0	37.0		22.3	N
Unisex toilet	1			1			1							2		CGB01	Mains	53.4	35.6		22.0	N
Unisex toilet	1			1			1							2		CGB01	Mains	54.0	40.0		21.5	N
Office			1								1	1		2	1x Hydro boiler/chiller	CGB01	Mains	52.3			22.2	N
Rear store			1										1			CGB01	Mains	56.0			22.0	N
Outside					1												Mains				21.8	N
COMMENTS:	Due to the rise in weather temperature, the cold water is over the recommended 20 ◦C, site has no control over thermal warming of incoming water.																					

6.2 Low-Capacity Hot Water Heaters with Storage (15 litres or less)

Building Name	**Caldicot council offices**
Reference No:	POUH01
Location:	Reception area
Cold water feed:	Mains
Nominal capacity:	15L
Material of construction:	Stainless Steel
Insulation:	Pre-insulated
Primary heat source:	Immersion
Heating Operation:	Continuous
Temp of outlet pipe (surface):	60.0
Expansion vessels fitted:	Yes
Number of expansion vessels:	One
Expansion vessel creating dead leg	No
Drain point fitted to expansion vessel	No
Periods of low/no use > 1 week:	No
General access:	Good
RISK RATING:	**LOW**
Photo:	
Comments:	*Site should fit drain valve of expansion vessel supply for maintenance.*

6.3 Instantaneous Hot Water Heaters

Building Name:	**Caldicot council offices**
Reference No:	CG01
Location:	Rear store
Type:	Combination Boiler
Heat source:	Gas
Cold water feed:	Mains
Outlets:	Multiple
Spray nozzle fitted:	No
General Access:	Good
Temperature of flow °C:	56.0
RISK RATING:	**LOW**
Photo:	
Comments:	

6.9 Pipework Dead ends, Dead legs & Infrequently Used Outlets

Dead-ends *(N.B. A dead-end is a length of pipework where the end has been capped off. This creates an area for sediment to collect & form water stagnation.)*

Dead-legs *(N.B. A dead-leg is a length of pipework leading to an outlet where the water contained in this pipework lies static for period of more than 1 week or the outlet is no longer used.)*

Infrequently used outlets *(N.B. An infrequently (little) used outlet is where the water contained in the supply pipework can occasionally lie static for period of 1 week or more.)*

Location	Water Service	Brief Description	Photo (where required)
Rear store	**Mains**	**Operational dead leg -** the water heater is fitted with a filler loop the supply water can be standing for long periods of time, if possible, implement routine flushing. Remove connection when not in use.	
Outside	**Mains**	**Potential infrequently used outlets –** the outside outlet may not be used regularly, especially over the winter months or rainy, ensure the outlet is used at least weekly or implement routine flushing.	

6.5 Sentinel Points

The location to measure the temperature shall be marked on pipework / outlet with an arrowhead or suitable indicator.

The frequency of the temperature checking of the sentinel points must be **Monthly** & hot water (HW) subordinate loops a minimum of **3 Monthly.**

Temperature control measures include testing hot and cold water at specified locations (i.e. sentinel taps; nearest and furthest from the calorifier / HW storage and the cold-water storage tank, should be marked with an identification sticker for all personnel to identify), by:
- Checking and recording the water temperature at the draw-off. For the hot service water should achieve a temperature of **50°C (55°C in health premises)** within one minute of running the outlet & at HW loops.
For cold water the temperature should remain **below 20°C** after running the tap for up to two minutes.

- Where a TMV is fitted; checking and recording the surface temperature of the –
Hot water pipe up stream of the TMV, one minute within running the water, to see if it has reached a temperature of **>50°C**.
Cold water pipe up stream of the TMV, two minutes after running the water, to see if it has reached a temperature of **<20°C**
(Note this is not the temperature of the water coming out of the tap, but the temperature of the **hot and cold-water pipe prior to entering the TMV**).
TMV WHB outlet temperatures must be 41^{0}C + or – 2°C after 1 minute of running the water

The results of the monthly temperature checks shall be recorded in a site **Legionella Control Record System.**

Temperatures will be taken at the specified locations with a pipe thermocouple (touch probe) and an immersion probe.

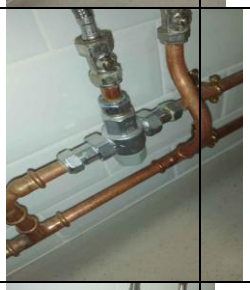
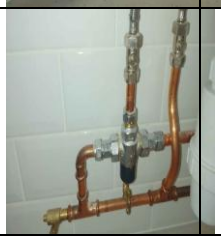
If the measured temperature falls outside of the above parameters, the Responsible Person should be notified and action taken accordingly to issues.

The **Legionella Control Record System** is deemed a controlled document. The **Legionella Control Record System** shall be the responsibility of the Responsible Person, and he or she must ensure records are kept up to date and standards maintained. The Responsible Person MUST carry out a monthly record inspection to ensure all records are up to date and within the guidelines stated in HSG 274 part 2.

The following points are what the MEL risk assessor deemed to the best his ability to be sentinel points / HW loops based on the findings in the risk assessment. These have also been identified on any schematic produced by MEL for this report.

Sentinel Cold Water Monthly Points (Tank only)	Sentinel Hot Water Monthly Points	Subordinate Hot Water 3 Monthly Loops

6.6 TMV's (Thermostatic Mixing Valves)

TMV Ref.	Building Name	Location	Manufacturer	Accessible For Service	General Condition	Service Frequency	Risk Rating	Photo	Comments
1	Caldicot Council Offices	Unisex toilet	Unknown	Yes	Satisfactory	None	Med		
2	Caldicot Council Offices	Unisex toilet	Unknown	Yes	Satisfactory	None	Med		
3	Caldicot Council Offices	Unisex toilet	Unknown	Yes	Satisfactory	None	Med		

7 Review of Control Measures

7.1 Management Records

Statutory Duty Holder and Responsible Persons:

Is the Statutory duty holder for any health and safety issues clearly identified and recorded	No
Is the Responsible person for legionella control clearly identified and recorded	No
Is there a documented communication path for all individuals with roles within the legionella bacteria management control process?	No
Does this communication path incorporate the maintenance contractor and any sub-contractors responsible for legionella bacteria control measures?	No
Are deputies designated for when named individuals have holidays or ill-health	No
Have clearly defined standards for control parameters of all systems been set with suitable action levels and response times agreed for each party?	No
In the event of a loss of control or hazard being identified at the premises are emergency contacts specified in the on-site documentation system?	No
Are outbreak emergency procedures in place?	No

Legionella Control Records:

Previous legionella risk assessment in place & available	No
a. Date of issue	Not seen
b. By whom?	Not seen
Schematic diagrams available on site	No system had changed
Are there clearly defined arrangements inc. allocation of responsibilities and escalation procedures?	No
Is there a written scheme of control for legionella on site?	No
Does the written scheme of control have a suitable scope and purpose?	No
Was the written scheme of control written to reflect the previous risk assessment?	No
Does the written scheme include a record of the management structure?	No
Does the written scheme include suitable control limits in line with HSG 274 and the current legionella risk assessment?	No

Are the control limits currently used effective or are they failing in any way?	No
Are there appropriate method statements within the written scheme of control?	No
Are there appropriate planned corrective actions within the written scheme of control?	No
Have all non-conformances had correct actions applied?" and send as evidence?	Not seen
Have all non-conformances been actioned in a timely fashion?	Not seen
Once resolved were they rechecked to ensure successful completion, where appropriate?	Not seen
Have all non-conformances been signed off?" and send as evidence?	Not seen
If there were any persistent non-conformances, were they escalated effectively?	Not seen
Did the results and actions taken within the logbook demonstrate the individuals involved in the legionella control were competent?	Not seen

Training Records:

Has the Responsible Person received training in accordance with ACOP L8 or HTM 01-05, HTM 04-01 in healthcare premises or HSG 282 where applicable?	No
Is evidence of this training readily available?	No
Has the Deputy Responsible Person received training in accordance with ACOP L8 or HTM 01-05, HTM 04-01 in healthcare premises or HSG 282 where applicable?	No
Is evidence of this training readily available?	No
Has the appointed monitoring person(s) received training in accordance with HSG 274 part 2 or HTM 01-05, HTM 04-01 in healthcare premises or HSG 282 where applicable?	No
Is evidence of this training readily available?	No
Legionella service provider appointed	No
a. Legionella service provider company name	N/A
b. Service provider LCA registered	N/A
Have all on-site maintenance persons received training in accordance with HSG part 1,2,3 where applicable or HTM 01-05, HTM 04-01 in healthcare premises or HSG 282 for Spa Pool systems where applicable?	N/A
Is evidence of this training readily available?	N/A

Routine Servicing / Maintenance Records:

TMVs serviced to required standards and recorded?	No
Strainers cleaned and disinfected to required standards and recorded?	N/A
Filters replaced as per manufacturers recommendations and recorded?	Records insufficient or incomplete
Water softeners maintained as pre manufacturer's instructions?	N/A
Fire suppression systems maintained as per manufacturer's instructions?	N/A
Emergency showers / eye wash maintained as per HSG 274 part 3 / manufacturer's instructions?	N/A
Air Handling / Air Conditioning Units maintained as per manufacturer's instructions?	N/A
DUWL's maintained to required standards and recorded as per HTM 01-05 guidelines.	N/A
Other risk systems maintained to required standards and recorded as per HSG 274 part 3 guidelines where applicable	N/A
Spa baths maintained to required standards and recorded as per the Health and Safety Executive Technical guidance (HSG 272): The control of legionella and other infectious agents in spa-pool systems	N/A

Domestic Water Systems

Domestic water systems are very susceptible to colonization by Legionella bacteria where favourable conditions occur. Poorly designed, inadequately maintained systems, or those that operate at unsuitable temperatures, can aid the rapid multiplication of bacteria such as legionella within these services.

Any water system achieving temperatures within the band 20°C to 45°C may allow the establishment and proliferation of legionella bacteria. These conditions may occur within hot water services, including calorifiers or heaters, in deadlegs & deadends pipework, intermittently used water services, or indeed cold-water services where due to insufficient lagging, over-capacity and stagnation, warming occurs.

The direct risk comes from the generation of aerosols (fine water droplets). This may happen from any water outlet within the premises although the risk is low from non spray outlets.
Where showers, spray taps etc. are installed within the building water services, the risk is increased.

Are the design, construction and installation of the domestic hot water storage vessels and associated plant and pipework liable to prevent the proliferation of legionella bacteria in the systems?	No
Are site-specific contingencies for standby, out of use, breakdown, cleaning, maintenance and/or isolation of legionella bacteria detailed in the relevant documentation systems for this site?	No
If present, has the feasibility of removing recognised aerosol generating systems, e.g. showers or spray taps in the premises been considered? Does documentation demonstrate this?	N/A
Where identified, has redundant hot or cold-water pipework been suitably removed or cut back as far as possible?	N/A
Are hot and cold storage facilities that are not required suitably isolated and drained?	N/A

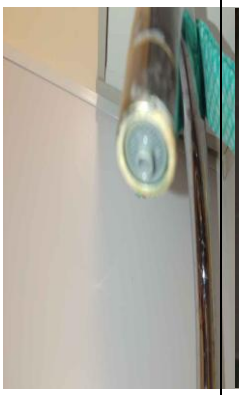
Domestic Water Systems (continued)

The following routine monitoring tasks are those outlined within the HSG 274 part 2

Is a procedure in place on non-recirculating systems where a number of identified outlets (sentinels) furthest and nearest to calorifiers or water storage heaters (>15 litres) are checked on a monthly basis for temperature after one minute of flushing to ensure they reach 50°C?	N/A
Is a procedure in place on circulating systems to take temperatures at return legs of principal loops (sentinel points) to confirm they are at a minimum of 50 °C (55 °C in healthcare premises) on a monthly basis ?	N/A
Is a procedure in place on circulating systems to take temperatures at return legs of subordinate loops, temperature measurements can be taken on the surface of pipes, but where this is not practicable, the temperature of water from the last outlet on each loop may be measured and this should be greater than 50 °C within one minute of running (55 °C in healthcare premises) on a quarterly basis.	N/A
Is a procedure in place for checking thermal insulation to ensure it is intact or to check whether weather proofing is required for external exposed components	No
Is a procedure in place to check the cold-water sentinel outlets on a monthly basis to ensure cold water temperatures are below 20°C after two minutes of flushing? This may also include other key locations on long branches to zones or floors	N/A
Is a procedure in place to check hot water service temperatures in the flow and return water from hot calorifiers or water storage heaters on a monthly basis?	N/A
Is a procedure in place for an annual check on the internal conditions of any calorifiers or hot water storage vessels for scale, sludge etc? or where not practicable drain valves are purged to remove debris in the base of the calorifier to a suitable drain	N/A
Is a procedure in place to check representative taps for hot and cold-water temperatures on a rotational basis, covering all locations, at least annually?	No
Is the condition of the cold storage water tanks inspected annually, and any accessible pipework and insulation included in such checks?	N/A
Are the remote and supply temperatures of cold storage water tanks taken annually?	N/A

If present, are showers including spray outlets regularly dismantled, descaled and disinfected at least quarterly or as necessary?	N/A
If present are local water heaters (15 litres or less) including combination boilers checked at least on a six-monthly basis to ensure they operate 50–60 °C (55 °C in healthcare premises) or to check the installation has a high turnover	No
Are suitable flushing regimes in place for infrequently used facilities that cannot be removed or isolated and drained down?	No
Is the condition of combination water heater header tanks inspected annually, and temperatures recorded on a monthly basis to Check water temperatures at an outlet to confirm the heater operates at 55–60 °C	N/A
Where fitted and practicable are expansion vessels flushed through and purged to drain at least on a six-monthly basis.	No
Where fitted are expansion vessels flow through type or fitted with anti legionella valves?	N/A
Is there a procedure for routine legionella sampling where susceptible persons are present.	N/A
Is there a procedure for routine bacti sampling where potable water is stored in a cold-water storage tank for drinking water supplies.	N/A

8 Photographs

Incoming mains isolation.		Typical high cold temperatures	
Mixed temperature low		**Typical flexible hoses**	
Hydro boilers/chillers with filters.		**Scale on outlets – not heavy**	
			

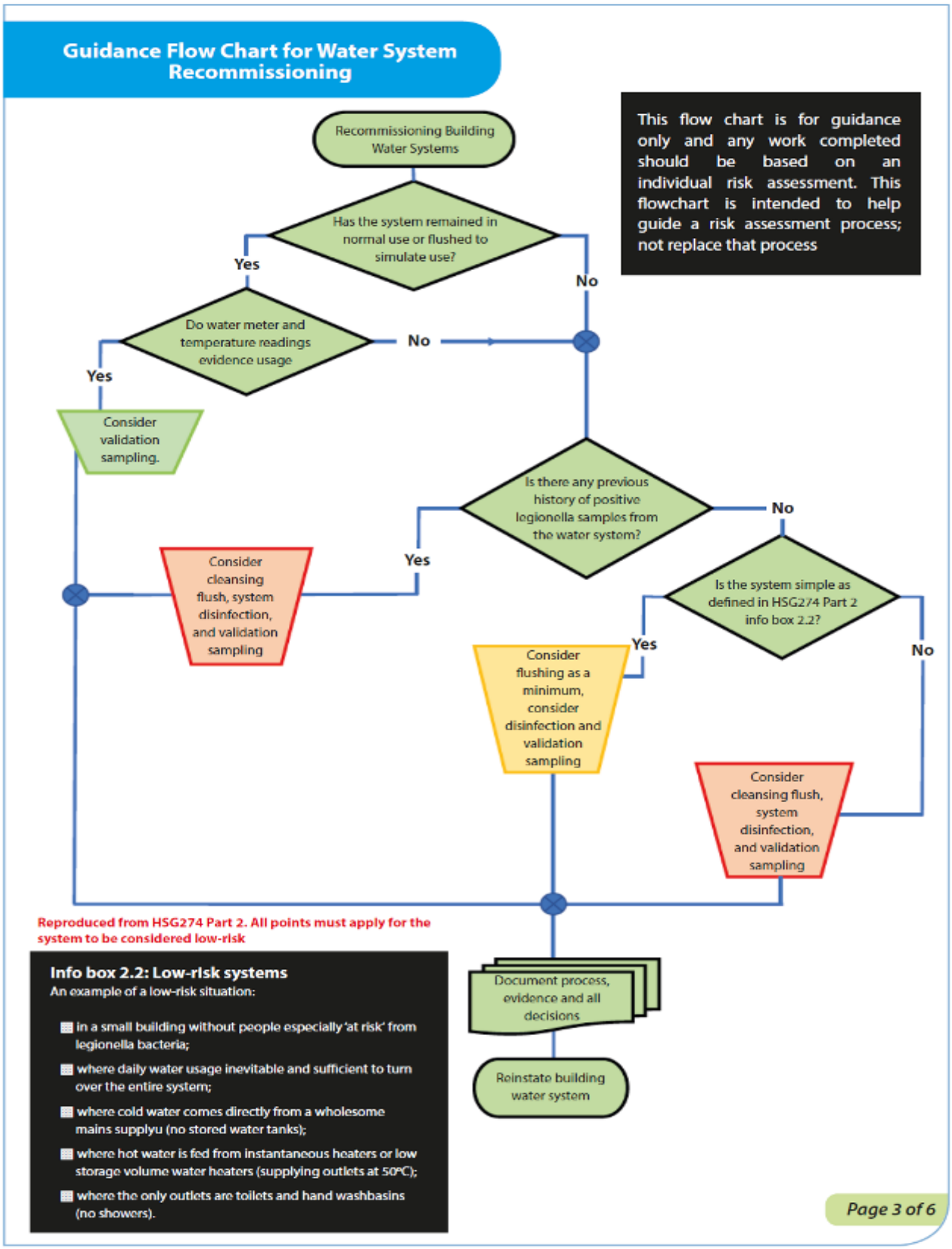
Jet washer and hose		Mobil bowser

9 Appendix

Table 2.2 Action levels following legionella sampling in hot and cold water systems

Legionella bacteria (cfu/l)	**Recommended actions**
>100 cfu/l and up to 1000	Either: ■ if the minority of samples are positive, the system should be resampled. If similar results are found again, a review of the control measures and risk assessment should be carried out to identify any remedial actions necessary or ■ if the majority of samples are positive, the system may be colonised, albeit at a low level. An immediate review of the control measures and risk assessment should be carried out to identify any other remedial action required. Disinfection of the system should be considered
>1000 cfu/l	The system should be resampled and an immediate review of the control measures and risk assessment carried out to identify any remedial actions, including possible disinfection of the system. Retesting should take place a few days after disinfection and at frequent intervals afterwards until a satisfactory level of control is achieved.

Source: HSG 274 part 2


Guidance Flow Chart for Water System Recommissioning
This flow chart is for guidance only and any work completed should be based on an individual risk assessment. This flowchart is intended to help guide a risk assessment process; not replace that process
Recommissioning Building Water Systems
Has the system remained in normal use or flushed to simulate use?
Yes
No
Do water meter and temperature readings evidence usage
No
Yes
Consider validation sampling.
Is there any previous history of positive legionella samples from the water system?
No
Yes
Consider cleansing flush, system disinfection, and validation sampling
Is the system simple as defined in HSG274 Part 2 info box 2.2?
Yes
No
Consider flushing as a minimum, consider disinfection and validation sampling
Consider cleansing flush, system disinfection, and validation sampling
Reproduced from HSG274 Part 2. All points must apply for the system to be considered low-risk
Info box 2.2: Low-risk systems
An example of a low-risk situation:
in a small building without people especially 'at risk' from legionella bacteria;
where daily water usage inevitable and sufficient to turn over the entire system;
where cold water comes directly from a wholesome mains supplyu (no stored water tanks);
where hot water is fed from instantaneous heaters or low storage volume water heaters (supplying outlets at 50ºC);
where the only outlets are toilets and hand washbasins (no showers).
Document process, evidence and all decisions
Reinstate building water system
Page 3 of 6

Emergency Procedure - Action in the event of an outbreak

Legionnaires' disease is notifiable under public health legislation in England and Wales but, in Scotland, legionellosis (ie all diseases caused by legionella) is notifiable under the Public Health (Notification of Infectious Disease) (Scotland) Regulations 1988.

An outbreak is defined by the Public Health Laboratory Service (PHLS) as two or more confirmed cases of legionellosis occurring in the same locality within a six-month period. Location is defined in terms of the geographical proximity of the cases and requires a degree of judgement. It is the responsibility of the Proper Officer for the declaration of an outbreak. The Proper Officer is appointed by the local authority under public health legislation and is usually a Consultant in Communicable Disease Control (CCDC). In Scotland, it is the Consultant in Public Health Medicine (CPHM) employed by the Health Board and acting as Designated Medical Officer for the local authority.

Local authorities will have established incident plans to investigate major outbreaks of infectious disease including legionellosis. These are activated by the Proper Officer who invokes an Outbreak Committee, whose primary purpose is to protect public health and prevent further infection. This will normally be set up to manage the incident and will involve representatives of all the agencies involved. HSE or the local authority EHO may be involved in the investigation of outbreaks, their aim being to pursue compliance with health and safety legislation.

The local authority, CCDC or EHO acting on their behalf (often with the relevant officer from the enforcing authorities - either HSE or the local authority) may make a site visit.

As part of the outbreak investigation and control, the following requests and recommendations may be made by the enforcing authority.
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.
To take water samples (see paragraphs 124-131, Part 2) 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/ies may take samples or require them to be taken.
To provide staff health records to discern whether there are any further undiagnosed cases of illness, and to help prepare case histories of the people affected.
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 operatives and managers; statements from water treatment contractors or consultants.

Any infringements of relevant legislation may be subject to a formal investigation by the appropriate enforcing authority.

Morgan Environmental Ltd ensures that our risk assessor is competent, suitably trained and holds the relevant experience to carry out legionella risk assessments to the required standard.

Our assessor Mr Peter Jones has over 15 years' experience in the water treatment industry working with domestic systems. Peter holds the following industry recognised qualifications:

- Peter Jones – Senior Legionella Risk Assessor
- **Experience**
- Peter has worked in the water management sector since 2007, accumulating over 15 years' experience in the water industry. He began with a water treatment provider as an Environmental Service Technician completing his legionella awareness training course allowing to gain knowledge to carry out ACOP L8 requirements for the maintenance of Cooling Towers, Cold Water Storage Tanks and Calorifiers, as well as monitoring of outlets and sampling. He carried these skills and experience over to a second water treatment provider in 2010 and further improved his knowledge by completing a City & Guilds accredited BS6 Legionella L8 Awareness and system Monitoring course.

- **Training**
- City & Guilds – WH004 Risk Assessment for Legionella Control in Water Systems
- BPEC – WREG Water Supply (Water Fittings) Regulations 1999
- BS6 Legionella L8 Awareness and system Monitoring
- WS8 - Legionella Risk Assessment of Water Systems
- HTM 04-01 Healthcare Guidance

- **Other**
- ECITB Safety Passport
- CSCS IOSH Safety, Health and Environment for Construction Workers
- BTS Confined Space Awareness
- UKATA Asbestos Awareness

REFERENCES

1) Health & Safety at Work, etc. Act 1974

2) The Control of Substances Hazardous to Health Regulations 2002

3) Approved Code of Practice & Guidance (L8) - The Control of Legionella Bacteria in Water Systems

4) BS 8558 Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages. Specification

5) The Water Supply (Water Fittings) Regulations 1999

6) Health Technical Memorandum 04-01: The control of legionella, hygiene, "safe" hot water, cold water and drinking water systems.

7) Health Technical Memorandum 01-05: Decontamination in Primary Care Dental Practices (HTM01-05)

8) Management of Health and Safety at Work Regulations

9) Successful Health & Safety Management HSG65 1997

10) TMVA: Recommended Code Of Practice For Safe Water Temperatures.

11) HSE: HSG 274 part 1 the control of legionella bacteria in evaporative cooling systems.

12) HSE: HSG 274 part 2 the control of legionella bacteria in hot & cold-water systems.

13) HSE: HSG 274 part 3 the control of legionella bacteria in other risk systems.

14) BS 8580-1: 2019 Water quality. Risk assessments for Legionella control. Code of practice.

15) BS 7592: 2022 Sampling for legionella bacteria in water system.

GLOSSARY

Aerosol	A suspension in a gaseous medium of solid particles, liquid particles or solid and liquid particles having negligible falling velocity.
Algae	A small, usually aquatic, plant which requires light to grow, often found on exposed areas of cooling towers.
Air-conditioning	A form of air treatment whereby temperature humidity and air cleanliness are all controlled within limits determined by the requirements of the air-conditioned enclosure.
Antibodies	Substances in the blood which destroy or neutralise various toxins or components of bacteria known generally as antigens. The antibodies are formed as a result of the introduction into the body of the antigen to which they are antagonistic as in all infectious diseases.
Bacteria	(Singular bacterium) A microscopic, unicellular (or more rarely multicellular) organism.
Biocide	A substance which kills micro-organisms.
Biofilm	A community of bacteria and other micro-organisms, embedded in a protective layer with entrained debris, attached to a surface.
Blow-down / bleed off	Water discharged from the system to control the concentration of salts or other impurities in the circulating water; usually expressed as a percentage of recirculating water flow.
Calorifier	An apparatus used for the transfer of heat to water in a vessel by indirect means, the source of heat being contained within a pipe or coil immersed in the water.
Chlorine	An element used in disinfection.
Cold water service (CWS)	Installation of plant, pipes and fitting in which cold water is stored , distributed and subsequently discharged.
Cooling Tower	An apparatus through which warm water is discharged against an air system; in doing so part of the water is evaporated to saturate the air and this cools the water. The cooler water is usually pumped to a heat exchanger to be reheated and recycled through the tower.
Concentration factor	Compares the level of dissolved solids in the cooling water with that dissolved in the make-up water (also known as cycle of concentration). Usually determined by comparison of either the chloride or magnesium hardness concentration.

Corrosion inhibitor	Chemicals which protect metals by: (a) passivating the metal by the promotion of a thin metal oxide film (anodic inhibitors); or (b) physically forming a thin barrier film by controlled deposition (cathodic inhibitors).
Dead end / blind end	A length of pipe closed at one through which no water passes.
Deadleg	Pipes leading to a fitting through which water only passes when there is draw-off from the fitting.
Dipslide(s)	A dip slide is a means of testing the microbial content of liquids, it consists of a plastic carrier bearing a sterile culture medium which can be dipped in liquid to be sampled. It is then incubated to allow microbial growth. The resulting microbial colonies are estimated by reference to a chart.
Disinfection	A process which destroys or irreversibly inactivates micro-organisms and reduces their number to a non-hazardous level.
Distribution circuit	Pipework which distributes water from hot or cold-water plant to one or more fittings/appliances.
Domestic water services	Hot and cold water intended for personal hygiene, culinary, drinking water or other domestic purposes.
Drift	Circulating water lost from the tower as liquid droplets entrained in the exhaust air stream; usually expressed as a percentage or circulating water flow but for more precise work it is parts of water per million by weight of air for a given liquid to gas ratio.
Drift eliminator	More correctly referred to as drift reducers or minimisers - equipment containing a complex system of baffles designed to remove water droplets from cooling tower air passing through it.
Evaporative condenser	A heat exchanger in which refrigerant is condensed by a combination of air movement and water sprays its surface.
Evaporative cooling	A process by which a small portion of a circulating body of water is caused to evaporate thereby taking the required latent heat of vaporisation from the remainder of the water and cooling it.
Fill / Packing	That portion of a cooling tower which constitutes its primary heat transfer surface; sometimes called 'packing' or 'pack'.
Fouling	Organic growth or other deposits on heat transfer surfaces causing loss in efficiency.

Half - life	Ratio of system volume to purge rate.
Hot water service (HWS)	Installation of plant, pipes and fittings in which water is heated, distributed and subsequently discharged (not including cold water feed tank or cistern).
Legionnaires' disease	A form of pneumonia caused by legionella bacteria.
Legionellae	The genus legionella belongs to the family Legionellaceae which has over 40 species. These are ubiquitous in the environment and found in a wide spectrum of natural and artificial collections of water.
Legionella	Type of aerobic bacterium which is found predominantly in warm water environments. (Single of legionellae).
L. pneumophila	One of the causative organisms of Legionnaires' disease.
Legionellosis	Any illness caused by exposure to legionella.
Pontiac fever	A disease caused by species of legionella, an upper respiratory illness less severe than Legionnaires' disease.
Make-up water	Water which is added to a cooling water system to compensate for wastage (e.g. via system leaks), evaporate loss and bleed.
Micro-organism	An organism of microscopic size including bacteria, fungi and viruses.
Non-oxidising biocide	A non-oxidising biocide is one that functions by mechanisms other than oxidation, including interference with cell metabolism and structure.
Nutrient	A food source for micro-organisms.
Oxidising biocide	Agents capable of oxidising organic matter, e.g. cell material, enzymes or proteins which are associated with microbiological populations resulting in death of the micro-organisms. The most commonly used oxidising biocides are based on chlorine or bromine (halogens) which liberate hypochlorous or hypobromous acids on hydrolysis in water. The exception is chlorine dioxide, a gas which does not hydrolyse but which functions in the same way.
Pasteurisation	Heat treatment to destroy micro-organism usually at high temperature.
Planktonic	Free floating micro-organisms in an aquatic system.
ppm	Parts per million: a measure of dissolved substances given as the number of parts there are in a million parts of solvent. It is numerically equivalent to milligrams per litre mg/l with respect to water.

Pond / Sump	Collection of cooling water at the base of a cooling tower.
Retention time	Time a chemical is retained in the system.
Scale inhibitors	Chemicals used to control scale. They function by holding up the precipitation process and/or distorting the crystal shape, thus preventing the build-up of a hard adherent scale.
Sero - group	A sub-group of the main species.
Sentinel taps	For a hot water services - the first and last taps on a recirculating system. For cold water systems (or non-recirculating hot water systems), the nearest and furthest taps from the storage tank. The choice of sentinel taps may also include other taps which are considered to represent a particular risk.
Sessile	Aquatic micro-organisms adhering to a surface normally as part of a biofilm.
Sludge	A general term for soft mud-like deposits found on heat transfer surfaces or other important sections of a cooling system. Also found at the base of calorifiers and cold-water storage tanks.
Shunt pump	A circulation pump fitted to hot water service/plant to overcome the temperature stratification of the stored water.
Slime	A mucus-like exudates which covers a surface produced by some micro-organisms.
Stagnation	The condition where water ceases to flow and is therefore liable to microbiological growth.
Strainers	A coarse filter usually positioned upstream of a sensitive component such as a pump control valve or heat exchanger to protect it from debris.
Thermal disinfection	Heat treatment to disinfect a system.
Thermostatic mixing valve	Mixing valve in which the temperature at the outlet is pre-selected and controlled automatically by the valve.
Total viable counts (TVC)	The total number of culturable bacteria (per volume or area) in a given sample (does not include legionella)
Risk assessment	Identifying and assessing the risk from legionellosis from work activities and water sources on premises and determining any necessary precautionary measures.
Windage	Physical loss of water from cooling tower caused by draught of air or wind - water is lost around the base of the cooling tower as a result of cross winds as opposed to drift.