

LEGIONELLA RISK ASSESSMENT

THE PREVENTION AND CONTROL OF LEGIONNAIRES' DISEASE



Client:	Wessex RFCA
Site:	Wyvern Barracks Building 7
Address:	Wyvern Barracks, Barrack Road, Exeter, EX2 6AR
Risk Rating:	Medium
Report Ref:	AQST/LRA/331
Surveyed By:	Jon Barton
Survey Date:	11 th -13 th March 2024
Report Date:	15 th March 2024
Recommended Review Date:	March 2026

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1. EXECUTIVE SUMMARY

This document is intended to identify the risk of developing legionnaire's disease from the building water system. The Health and Safety Executive Approved Code of Practice recommends Risk Assessments should be reviewed on a regular basis and in accordance with the current ACOP recommendations.

The Health and Safety commission issued an Approved Code of Practice for "Prevention of Legionellosis (including legionnaires' disease)" which came into effect on 15th January 1992, requiring a risk assessment to be undertaken. Guidance notes were issued by the Health and Safety Executive in the form of HS(G)70 and on the 8th January 2001 the Approved Code of Practice L8 came into force and BS8580:2019. This risk assessment is structured around the requirements of these documents, ACOPL8 revised and HSG274 Parts 1, 2 and 3 and The Water Regulations Guide.

Legionellosis is the term used for infections caused by legionella pneumophila and other bacteria from the family Legionellaceae. Legionnaire's Disease is a pneumonia that principally effects those who are susceptible due to age, illness, immunosuppression, smoking etc. and may be fatal. Legionellae can also cause less serious illnesses that are not fatal or permanently debilitating but which can affect all people. Infection is attributed to inhaling legionellae, either those water droplets which are small enough to penetrate deeply into the lung, or in droplet nuclei (particles left when water has evaporated). Legionellae are widespread in natural sources of water. They may enter man-made systems or water services, where they can multiply under certain conditions, and if there is a means of creating the transmitting water droplets, people in the vicinity may be at risk. Between 200-400 cases of legionellosis are reported in England and Wales every year.

For a risk to be present a chain of events has to occur:

- * System infection
- * Legionellae proliferation enhanced by system conditions
- * Aerosol formation
- * Inhalation of aerosol by susceptible individual

Since aerosol formation and inhalation is difficult to avoid the onus falls on the operator to prevent system infection and to eliminate conditions in which legionellae thrive. The aim is to reduce the risk to an acceptable level by controlling the conditions necessary for proliferation of the bacterium. As a general rule, in practice this means: Keeping the hot water storage temperature at greater than 60°C, maintaining cold water temperatures at less than 20°C, keeping water systems clean and in good condition and controlling contamination of the water systems. It is, however, understood that some small systems, particularly when instantaneous water heaters are being used as a hot water source, may not be able to achieve these parameters and further recommendations will be given as required.

In order to achieve this aim, a detailed legionellosis risk assessment has been carried out, the results of which are used to produce recommendations for the control of the bacterium.

Full details of the required actions are enclosed.

This risk assessment does not involve the preparation of the written scheme of control, but rather provides information that is critical to its preparation, improvement, and review.

Ensuring that there is a written scheme of control is a legal requirement of the duty holder, though they might instruct the risk assessor to advise or prepare the scheme of control on their behalf as a separate commission. It is important that operation and maintenance individuals are consulted.

The survey and assessment were conducted by Jon Barton of Aquastat in March 2024 on behalf of the RFCA.

This risk assessment only covers those water systems identified and made accessible to the assessor at the time of the survey.

Location: Within the Wyvern Barracks compound.

Site Description: Multiuse administrative building.

Site Layout: Large two storey building with offices, military intelligence area and kitchen/washroom facilities.

Mains Cold Water Services (MCWS): Mains water supplies all cold outlets and also provides the make-up for the water heaters.

Cold Water Storage Tank(s) (CWST) and Cold-Water Down Services (CWDS): None on site.

Hot Water Storage Vessel(s) and Hot Water Systems (HWS): None on site.

Thermostatic Mixer Valves (TMV) and Thermostatic Mixer Taps (TMT): There is one TMV located in G03 toilet.

Showers and Spray Outlets: There are electric showers within dedicated male and female ablutions.

Water Heaters: All hot water is provided by water heaters of varying capacities.

Expansion Vessels: There are two small expansion vessels associated with low volume water heaters only.

Water Softeners: None on site.

2. SUMMARY OF RECOMMENDATIONS and RISK RATING

This Risk Assessment has been carried out in order to ascertain the possible risk of contracting Legionellosis, including Legionnaires' disease, from water systems and to identify the maintenance activities required to control or prevent the risk from Legionella, including any remedial works that may be required to improve upon the findings of this assessment.

The water systems throughout this building, unless otherwise stated, have been surveyed utilising the specific asset survey forms within section six of this assessment. Each question is answered and, depending upon the survey findings, a risk score is allocated utilising the matrix below.

This matrix is designed to indicate possible risk or problematic areas within the assets or water systems.

Multiple questions will be asked for all aspects of the water asset or services present on the site.

The results from these questions will then be scored upon the risk of Legionella. The key to this scoring is:

KEY

	Risk Level	Action
N/A	The risk from Legionella is not applicable under normal operating conditions.	No action required for the control of Legionella. Other remedial actions may be applicable.
LOW	There is a low risk under normal operating conditions.	No additional actions required above ensuring compliance with ACoP L8
MEDIUM	There is a medium risk under normal operating conditions.	Implement risk reduction measures in compliance with ACoP L8 e.g.: Remedial Works or Control Scheme.
HIGH	There is a high risk under normal operating conditions.	Implement Immediate or more radical risk reduction measures e.g. Emergency disinfection. / System changes or prohibition of use.

Where Legionella management and training is insufficient or lines of communication are not established, which are quantifiable on the surveyor's experience and knowledge.

The assessor will use the knowledge of others as well as his own technical knowledge in the judgement of the water systems assessed within this document.

We cannot guarantee that all pipe work passing underground or through floors, walls and ceilings has been traced, and it is possible that certain system dead-ends or dead-legs may not have been identified. As a result, the schematic diagram(s) contained within this report only details the visible or assumed pipe work.

Whilst every effort has been made to ensure the accuracy of the content of this document, Aquastat will accept no responsibility for any omissions that are not included.

OVERALL SYSTEM RISK STATUS

The susceptibility of personnel upon this site to the cause and effects of Legionnaires' disease have been assessed within the known range for specific Legionella susceptibility. Understandably, not every person has been interviewed to their susceptibility. Therefore, assumptions have been made as appropriate, based upon visual observations and communication during this assessment.

Population Profile	
Health of Users	Young healthy adults represent a low/moderate risk from legionella exposure. Older adults represent a moderate risk
Property Occupancy	Continually occupied by permanent site staff.

Risk Assessment		LOW 1-2	MEDIUM 3	HIGH 4-5
Are conditions suitable for multiplication of bacteria including Legionella Pneumophila? <i>E.g. where optimum temperatures for microbial growth and stagnation occur, e.g. dead legs and infrequently used outlets.</i>				4
Are nutrients present within the system? <i>E.g. sludge, scale, rust, algae and other organic matter.</i>		2		
Is there a means of creating and disseminating breathable droplets? <i>E.g. aerosol generated by a shower.</i>			3	
Are high risk groups using the water services? <i>E.g. persons over the age of 45, those with impaired or underlying health issues and compromised immune systems.</i>			3	
Are control systems in place and checks currently being carried out? <i>E.g. Is monitoring being carried out at correct intervals? is it effective? Have there been positive legionella cases identified?</i>			31	
Risk Factor	15	MEDIUM		
Low 5-11; Medium 11-19; High 19+				
Important Note: Low risk does not mean no risk and all recommendations highlighted within this document should be addressed.				

SYSTEM TYPES		RISK RATING
COLD WATER MAINS:		
The expansion vessel in G03 toilet has been fitted upside down. Refit in a vertical position.		Medium
Actioned date:	Company/initials:	
COLD WATER STORAGE TANKS:		
None on site		
HOT WATER CALORIFIERS:		
None on site		
POINT OF USE WATER HEATERS:		
Multiple water heaters are not operational. Ensure all taped off/isolated water heaters are repaired/replaced or removed from the water system.		High
Actioned date:	Company/initials:	
Some low volume water heaters were distributing water <50.C. Confirm these achieve 50.C or are in constant use. - G59 bar -G67 kitchen		Medium
Actioned date:	Company/initials:	
The spray head associated with the instant water heater in the first floor rifles female WC contains scale/algae. Clean required.		Medium
Actioned date:	Company/initials:	
SHOWERS AND SPRAY OUTLETS:		
One of the male showers and one of the female showers has been placed out of order. Fix the issue and reinstate flow to the showers.		High
Actioned date:	Company/initials:	
GENERAL: Control Schemes		
There is a new logbook on site. This logbook new logbook should contain the following information: -A copy of this risk assessment -An up to date management structure listing the on-site responsible people -The RFCA legionella policy -Aquastat's reports (or add a statement showing where these records are kept) -Evidence of any servicing/maintenance -Results from any legionella or TVC samples		High
Actioned date:	Company/initials:	
The site responsible person should receive the appropriate legionella training. It is imperative that someone on site understands why control measures are put in place. The site responsible person should also be familiar with the RFCA legionella policy and should ensure that they are fulfilling the requirements of this policy.		High
Actioned date:	Company/initials:	
The site responsible person (or deputy RP) should also oversee departmental flushing and ensure (if outlets have been identified as infrequently used) that flushing records are up to date. Possible infrequently outlets include: -G67 WHB (brown water discharged) -Showers -2 x outside taps		High
Actioned date:	Company/initials:	
Dead legs require attention. See section 6.6 of this report.		High
Actioned date:	Company/initials:	
Consider replacing flexible hoses with copper		Low
Actioned date:	Company/initials:	

LOG BOOK DOCUMENTATION/RECORD KEEPING

PREMISES : Wyvern Barrack - Building 7

Is there a water hygiene log book on site	YES	
If yes - please confirm the following:		
Where is the log book located?	Building 22	
Name and position of person responsible for log book?	Dean Bywood	
Has this person received the appropriate training in Legionella Control & is there evidence		NO
Does the log book contain a copy of the existing Legionella Risk Assessment?	YES	
Does the log book contain written scheme for Legionella control?		NO
Are there any non-conformances outstanding from previous Risk Assessments		NO
Are monthly temperature checks being taken and regularly recorded?	YES	
Is there an attendance log sheet in the book?	YES	
If applicable are showers being dismantled, cleaned and disinfected on a regular basis and regularly recorded?	YES	
Are CWST's and Hot Water Storage Vessels being monitored on a 6 monthly or Annual basis?	N/A	
If applicable are little used outlets being flushed weekly and regularly recorded?		NO
If applicable are mixer valves being serviced on an annual basis and regularly recorded?	YES	
If no log book on site, please advise the following:		
Is the log book held at a different location?		
If yes - please give name of responsible person and full address and telephone number	We understand copies of all related works are held centrally and uploaded onto a shared drive	
Is there an asset register on site?	YES	
Are Safety Data Sheets held for chemicals associated with Legionella control?		NO

If there is no log book on site, or held at a different location this represents a non-compliance with the Approved Code of Practice

All records and inspection reports should be kept in the site legionella control logbook for a period of 5 years

If the log book is held at a different premises, it is the duty of the responsible person to ensure the above checks are carried out and fully recorded.

Control Scheme	Is it Actioned	Carried out by whom	Frequency	Is it logged	Comments
Infrequently used outlet flushing	No	Site	Weekly	No	Required Weekly
Hot and cold sentinel outlets temperature monitoring	Yes	Aquastat	Monthly	Yes	Required Monthly
Hot and cold representative outlet monitoring	Yes	Aquastat	Monthly	Yes	Required Monthly
Shower, rinse hose, spray outlet descales	Yes	Aquastat	Quarterly	Yes	Required Quarterly
TMV servicing	Yes	Aquastat	Annually	Yes	Required Annually
Strainer cleaning	Yes	Aquastat	Annually	Yes	Required annually
Risk Assessment	Yes	Aquastat	Every two years	Yes	This assessment replaces out of date LRA
Log Book Audit	No	Site	Annually	No	Log book required for implementation of control schemes
Regular reviews of Control schemes, Training and competency.	No	Site	Annually	No	Required
Sampling (Legionella or TVC)	Yes	Aquastat	Annually	Yes	As Required

3. GENERAL PRECAUTIONS AND ACTIONS

The list below indicates the essential practical maintenance/management actions for which the head of site is responsible for ensuring.

1. Operate hot water systems at or above the approved minimum temperature. Storage should be above 60°C. Outlet (tap) temperatures should be above 50°C (unless fitted with a thermostatic mixing valve (TMV). Terminal fittings or communal showers in buildings used by young children/the very old and those with sensory loss should be supplied with water through thermostatic mixing valves so that the temperature of the water discharged at the outlets does not exceed 43 degrees C.
2. Maintain cold systems at or below the approved maximum water temperature. It is acceptable for the temperature to be 2°C greater than the incoming mains water temperature. However, this should not exceed 25°C.
3. Infrequently used outlets should be removed and any dead legs capped off at the main circulation or added to a flushing regime. Where showers are required and retained, they are to be run at least once per week or if possible, daily. Shower heads should be cleaned and disinfected in accordance with HSG274 at least on a quarterly basis.
4. Avoid the creation of unnecessary aerosols of water.
5. Ensure that the system is cleaned and disinfected if you become aware of any activity or occurrence, which you believe, may jeopardise water hygiene. Should a disinfection be required an Aquastat representative could advise?
6. Maintain records of temperature checks – regular temperature checks should be taken from selected tap outlets after one running minute. A standard UKAS calibrated thermometer held under the water flow is all that is needed. The temperature should be recorded in the legionella log book. The results recorded on a simple temperature record table. When temperatures consistently fail to comply with the approved ranges your water hygiene company should be contacted for further guidance and advice.
8. When the site is unused for more than 72 hours it is advisable to run hot and cold tap outlets on entry to the building to ensure stagnant water is removed from the pipework before use. **
9. After plumbing (i.e. new water heater or pipework alterations etc.) have been carried out, the site should be chlorinated to BS8558 standard - it may be necessary to fit an injection point to enable this process.
10. All outside bib taps should be fitted with a double check valve to prevent back flow.
11. Buildings with mixtures of lead, copper and iron pipework should be considered for refit in the long-term budget.
12. Dedicated drinking water tap should be clearly labelled.

13. Intermittently Used Buildings:

** On entry to a building after period of closure one senior nominated person should ensure the following before any personnel are allowed to use the water systems.

- a. The furthest tap from the mains entry point should be turned on and flushed – this will ensure that any water lying dormant within the building or trapped in the feed pipe from the mains supply is thoroughly flushed and allowing the cold water to attain towns water temperatures at outlets. Approximately 2-3 minutes constant running of a mains tap if the building is close to the towns water stop tap, or 10 minutes if over 100yds should be sufficient.
- b. Instantaneous water heaters are not designed to store hot water at 60 degrees as the guidelines suggest but we would recommend that the heaters are turned on and allowed at least 5 minutes for the temperature to rise to over 45 degrees C before use.

14. Positive Legionella Results

14.1 Positive Legionella results from a water system are reported to the client's responsible person by the fastest means available. This is usually a telephone call or email which will be confirmed by emailing the laboratory's analysis report and setting down in writing the initial corrective measures that we and/or our client should be undertaking.

14.2 The corrective measures advised will depend on individual circumstances and will be based on the guidance notes from HSE's ACOP HSG274 Parts 1,2,3 and will be instigated as quickly as possible after receiving an order from client.

4. GENERAL SITE INFORMATION

Building Description and type of use	Administrative/office building with ablutions and a bar.
Approx. number of occupants and overall age group	Unknown.
Normal operational hours of this building	Typically, office hours.
On site contact name at date of LRA	Dean Bywood (Barrack Manager)

SCOPE OF RISK ASSESSMENT

- Non-intrusive Site inspection visit of the agreed survey site to determine the current condition and usage of plant associated with domestic water systems on site.
- Non-intrusive Site inspection visit of the agreed survey site to determine the current condition of the management control of plant associated with domestic water systems on site.
- Produce a written report to relay the results generated from the site visit.
Produce a site-specific asset register.
Produce a site-specific and up to date schematic of the water systems of the survey site.

The temperatures have been taken and recorded from all areas that were accessible to the assessor during the survey; however, in larger complex buildings a representative number of temperatures may only be taken and recorded.

The following areas of the site have not been assessed:

Location:	Assets:	Reason:
Various locked doors	Unknown	This is a military site. It is not reasonably practical to gain access to all locked doors.
Female ablutions	Water heater header tank	Not possible due to lone working.

These listed water systems will only be assessed for risk of Legionellosis and not for any other factor.

The extent of the Risk Assessment is reliant on information supplied from site at time of survey and on observable conditions.

Whilst every effort has been made to ensure the accuracy of the content of this document, Aquastat will accept no responsibility for any omissions.

5. LINES OF COMMUNICATION AND RESPONSIBILITY

At this site the following key contacts have been identified.

	NAME	ADDRESS	TEL NOS
Duty holder: <i>Individual with the legal responsibility to ensure that health and safety is managed effectively</i>			
	Mark Armstrong	Wessex RF & CA Mount House Mount Street Taunton TA1 3QE	01823 217940 wx-estatesn@rfca.mod.uk
Nominated on site responsible person: <i>Individual appointed with and who has accepted responsibility under the authority of the duty holder for ensuring that for the control of Legionella all those assigned to carry out tasks are competent to do so.</i>			
	Kelvin Walker	Wessex RF & CA Mount House Mount Street Taunton TA1 3QE	01823 217942 wx-estates@rfca.mod.uk
Deputy on site responsible person: <i>In a large undertaking there may be more than one responsible person</i>			
Deputy on site responsible person	Dean Bywood (barrack manager)	Building 22, Wyvern Barracks	dean.bywood100@mod.gov.uk
	Major Chris Mills (QM)	Wyvern Barracks	
Water Supply Company	South West Water	Peninsula House Rydon Lane Exeter EX2 7HR	01392 446688
Mechanical contractor or Maintenance company	Wessex RF & CA	Mount House Mount Street Taunton TA1 3QE	01823 250116
Electrical contractor or maintenance company	Wessex RF & CA	Mount House Mount Street Taunton TA1 3QE	01823 250116
Water Treatment Company for this assessment	Aquastat	Unit N – The Old Parlour Purn House Farm, Bleadon Weston-Super-Mare North Somerset BS24 0QE	Tel: 01934 811264 Email - enquiries@aquastat.co.uk
	1 st Company contact	Gary Ford General Manager	As above or email gary.ford@aquastat.co.uk
	2 nd Company contact	Louise Blakemore	As above or email louise.blakemore@aquastat.co.uk
Water Treatment company for Compliance tasks as per HSG274	Aquastat	Unit N – The Old Parlour Purn House Farm, Bleadon Weston-Super-Mare North Somerset BS24 0QE	Tel: 01934 811264 Email - enquiries@aquastat.co.uk

NB: *If any of the above are not available at the time of inspection it may represent a gap in management procedures which could lead to a risk of infection through miscommunication.*

NNB: *Any changes in the above structure must be recorded as soon as they take effect, and all parties must be notified.*

6 SURVEY DETAILS:

6.1 MAINS WATER SUPPLY REPORT

Source of supply	Mains water
Number of mains cold water supply?	1
Location of main isolation valve?	Roadside entrance
Is there a water meter installed?	No
Is the pipework labelled?	No
Materials of construction	Copper
Are there any materials or fittings visibly present on the mains water system, that do not conform to the Water Regulations Advisory Scheme (WRAS) directory?	No
Mains water temperature °C (sentinel outlets)	Nearest Tap to Incoming Main: 11.C Furthest Tap from Incoming Main: 12.C
Are all other distribution temperatures that were tested within the correct temperature range? i.e. Below 20 °C?	Yes
Are there any non- flow through expansion vessels to any services on this system?	Yes
Is the pipework suitably insulated?	Yes
Does the cold-water supply have any inline filters including scale inhibitors/softeners?	No
COMMENTS	
Mains Water Supply Risk Score	Medium

6.1 MAINS WATER SUPPLY REPORT (continued)

Photos

	
<p>Mains water isolation</p>	<p>Upside down expansion vessel in G03 WC</p>

6.2 OTHER ASSETS REPORT

Are dead legs / infrequently used outlets present within system pipework?	Multiple toilets and water heaters are not operational and are creating dead legs on the water system.
Are thermostatic mixer valves present on individual outlets?	Yes
Are there single mixer valves serving a number of outlets?	No
Is the mixed temperature of the pipework >1m?	No
Are flexible hoses fitted to any services on the mains water system?	Yes
Is there any unused equipment connected?	No
Is any scale/debris present on any of the tap outlets?	Yes
Do any tap outlets have any spray or other inserts fitted?	Yes
Are strainers fitted?	No

	
Example of isolated area	Fouled spray outlet in 1 st floor rifles female WC

6.3 COLD WATER STORAGE TANK REPORT

None on site.

6.4 HOT WATER STORAGE REPORT

None on site.



6.5 SHOWERS & SPRAY OUTLETS

Site : Building 6

SHOWERS/SPRAY HEADS

Location	Nos of showers	Dismantled/ cleaned and disinfected YES/NO	Overall condition	Any repairs replacements	Regularity of Use
Female ablutions	2	No	Poor	Yes	Unknown
Male ablutions	2	No	Poor	Yes	Unknown
COMMENTS:					
<ul style="list-style-type: none"> Two showers have been isolated/taped off; repair replace as required. Showers should be flushed weekly if not used weekly. 					

Photos



	
Isolated shower	Taped off shower

6.6 SCHEDULE OF DEAD LEGS/BLIND ENDS

Site : Wyvern Barracks - Building 7

LOCATIONS	SYSTEM	ACTION
Isolated female shower	Mains	Reinstate flow to shower
Isolated male shower	Mains	Reinstate flow to shower
Cleaners cupboard	Water heater	Repair/replace the water heater
G59 bar	Mains	Remove dead leg at source
G67 female WC	Water heater	Repair/replace the water heater
G67 male WC	Water heater	Repair/replace the water heater
1 st floor rifles WC	Water heater	Repair/replace the water heater (fuse removed)
1 st floor conference room male WC	Hot and cold water	Fix the issue and reopen the toilets
GF female WC	Water heater	Repair/replace the water heater
MI male WC	Water heater	Repair/replace the water heater
MI female WC	Hot and cold water	Fix the issue and reopen the toilets

PHOTOS:

	
Isolated shower	Taped off shower

PHOTOS:



Bar area dead leg



Taped of male toilet area



Example of taped off basin



Taped off female WC



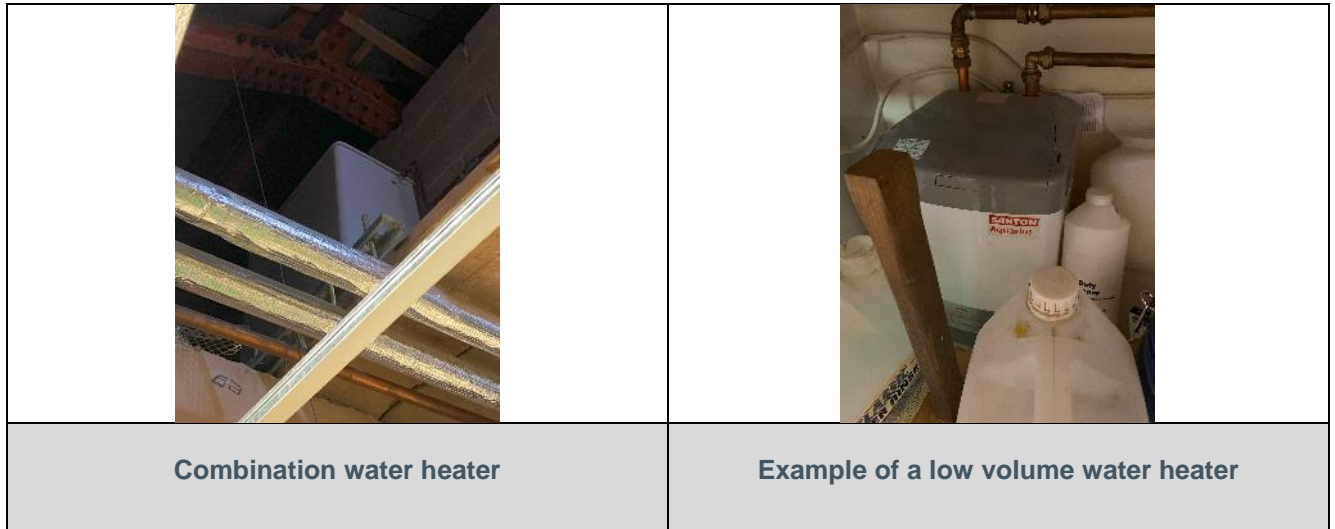
Taped off water heater

6.7 POINT OF USE WATER HEATERS

EXPANSION VESSEL INFO

Water Heater ID Number	Location	Make/model and capacity of each heater	Mains or tank fed	Full clean possible	Is there a pressure vessel – Yes/No	If yes – make model and size and whether fitted horizontally or vertically
1	Female ablutions	Sadia 125	Mains	Yes	No	-
2	G/F Bar – G59	Santon 7ltr	Mains	No	No	-
3	G/F Cleaners – G49	Santon 7ltr	Mains	No	No	-
4	G/F Kitchen - G67	Santon 7ltr (<i>sink</i>)	Mains	No	No	-
5	G/F Gents - G67	Santon spray	Mains	No	No	-
6	G/F Kitchen - G67	Santon spray (<i>whb</i>)	Mains	No	No	-
7	G/F Ladies - G67	Santon spray	Mains	No	No	-
8	1 st f 6 rifles – Gents	Sadia handy	Mains	No	No	-
9	1 st f 6 rifles – Ladies	Santon spray	Mains	No	No	-
10	1 st f 6 rifles toilet	Santon spray	Mains	No	No	-
11	1 st f Conference Gents	Santon spray	Mains	No	No	-
12	G/F Ladies LHS	Sanspray	Mains	No	No	-
13	G/F Ladies RHS	Sanspray	Mains	No	No	-
14	G/F MIT Gents	Sadia handy	Mains	No	No	-
15	G/F MIT Gents	Sadia handy	Mains	No	No	-
16	G/F MIT female	Santon spray				
17	1 st f Ladies – F03	Sadia handy	Mains	No	No	-
18	1 st f Ladies – F03	Triton instant	Mains	No	No	-
19	1 st f Gents – F07	Triton instant	Mains	No	No	-
20	G/F - G04 Kitchen	Sadia 15ltr	Mains	No	Yes	2 litre horizontal
21	G/F - G03 – Mixed wc	Ariston 10ltr	Mains	No	Yes	2 litre upside down
22	G17 - Toilet	Heatstore	Mains	No	No	-
23	F15 kitchen	Santon 7ltr (<i>sink</i>)	Mains	No	No	-
24	F15 kitchen	Santon spray	Mains	No	No	-

PHOTOS:



For information purposes:

- A. All cold water should be stored at less than 20 degrees C.
- B. All hot water should be set to produce at least 45 degrees C at outlets after one running minute.
- C. Temperatures between 20 degrees C at 45 degrees C produce ideal breeding ground for bacteria and should be avoided at all times.

6.8 FIRE HOSES

Fire hoses were not located on this site.

6.9 WATER SOFTENER

Water Softeners were not located on site.

7. WATER OUTLETS: SITE: Wyvern Barracks - Building 7

Location	Sentinel /Rep Outlet	Sink	WHB	WC T/M	Other	Shower	Bath	Temperature			Flexible Hose	Expansion Vessels	TMV's	Mains Tap	Tank Tap	Hot Tap	HW Source
								Hot	Cold	Blended							
FF male conference WC	Y	-	1	2	2	-	-	-	-	-	0	-	-	1	-	1	Taped off
F15 kitchen	Y	1	1	-	-	-	-	55 35	12	-	0	-	-	1	-	2	2 x WH
F03 female WC	-	-	2	2	-	-	-	30	11	-	0	-	-	2	-	2	2 x WH
F07 male WC	-	-	1	1	1	-	-	29	11	-	0	-	-	1	-	1	1 x WH
G04 kitchen	Y	1	-	-	-	-	-	60	12	-	0	1	-	1	-	1	1 x WH
G03 WC	Y	-	1	1	-	-	-	50	12	42	2	1	1	1	-	1	1 x WH
GF female WC	-	-	2	2	-	-	-	-	-	-	0	-	-	2	-	2	Out of order
G17 WC	-	-	1	1	-	-	-	35	11	-	0	-	-	1	-	1	1 x WH
MIT female WC	Y	-	1	2	-	-	-	-	-	-	0	-	-	1	-	1	Taped off
MIT male WC	-	-	2	1	2	-	-	29	11	-	0	-	-	2	-	2	2 x WH
G67 male WC	-	-	1	1	-	-	-	-	-	-	0	-	-	1	-	1	1 x WH
G67 female WC	-	-	1	1	-	-	-	-	-	-	0	-	-	1	-	1	1 x WH
G67 kitchen	Y	1	1	-	-	-	-	45	11	-	0	-	-	2	-	2	2 x WH
Bar	Y	1	1	-	-	-	-	39	11	-	0	-	-	2	-	1	1 x WH
Cleaners	Y	1	-	-	-	-	-	-	11	-	0	-	-	1	-	1	1 x WH
Female ablutions	Y	-	2	3	-	2	-	66	11	-	0	-	-	2	-	2	CWH
Male ablutions	Y	1	2	2	2	2	-	66	11	-	0	-	-	3	-	3	CWH
FF rifles WC	-	-	1	1	-	-	-	40	12	-	-	-	-	1	-	1	1 x WH
FF female WC	-	-	1	1	-	-	-	30	12	-	-	-	-	1	-	1	1 x WH
FF male WC	-	-	1	1	-	-	-	-	12	-	-	-	-	1	-	1	1 x WH

Water Outlet Legend:

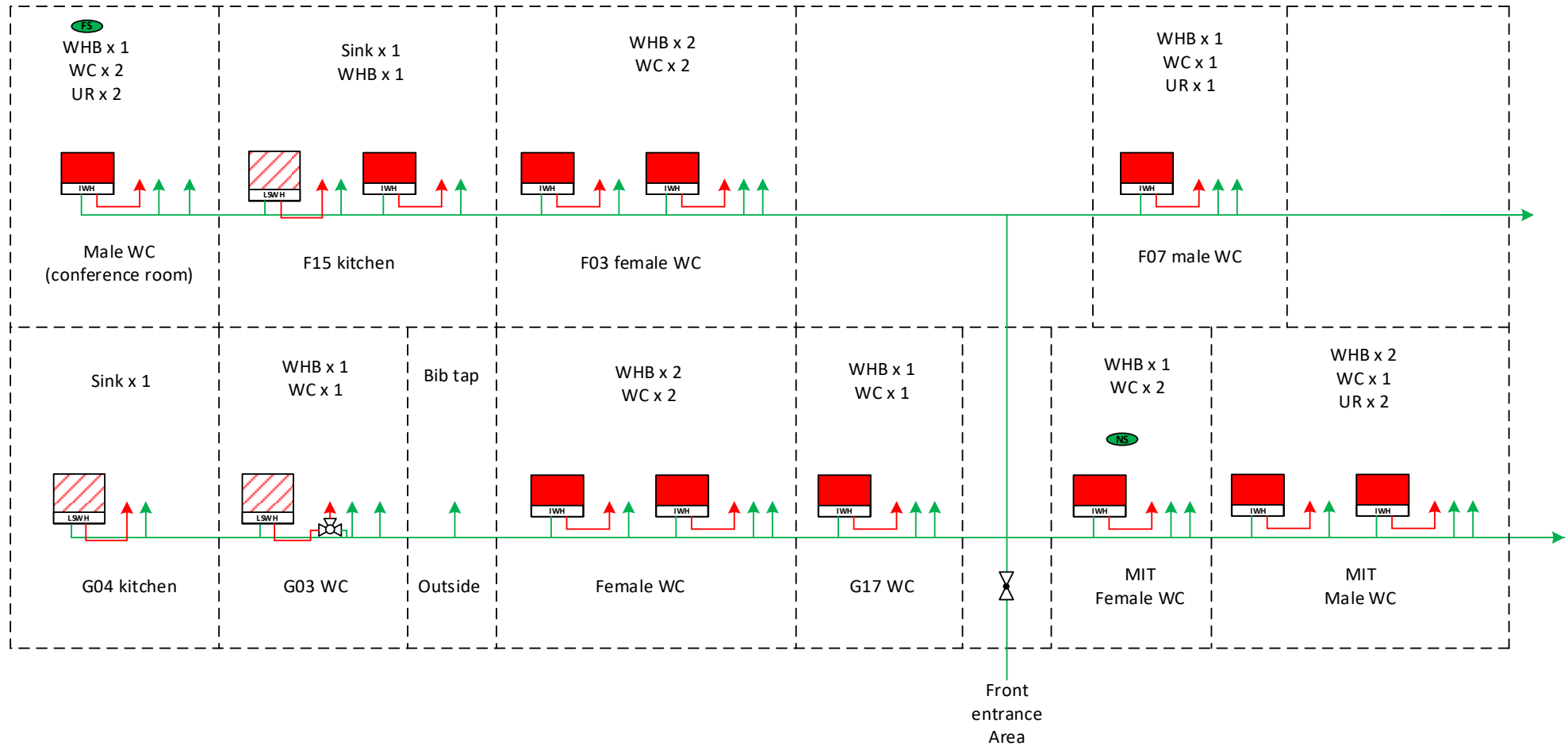
SNK = Sink
UR = Urinal
DWF = Drinking Water Fountain
HBT = Hose Bib Tap
TMV = Thermostatic Mixing Valve
ESH = Electric Shower
QFL = Quick Fill Link
EXP = Expansion Vessel
CM = Coffee machine
RH = Rinse Hose
SPB = Spray Booth
SO = Steam Oven
BIB = Bib tap

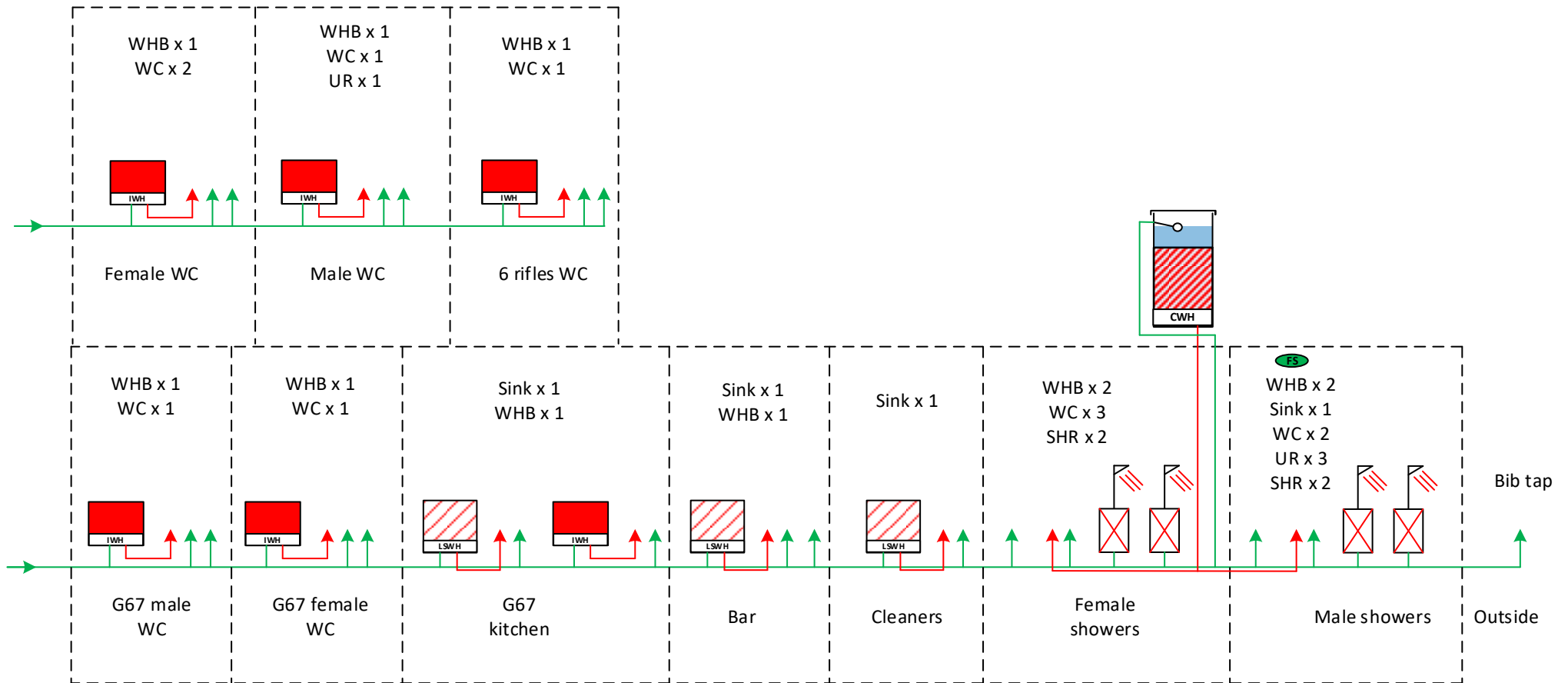
WHB = Wash Hand Basin
TSH = Thermostatic Shower
CWD = Chilled Water Dispenser
WSM = Washing Machine
HWB = Hot Water Boiler
CAL = Calorifier
BE = Blind Ends
STR = Strainer
MSH = Mixer shower
CO = Combi Oven
INF = Infrequently
BID = Bidet
TB = Tea Boiler

WC = Water Closet
WH = Water Heater
VM = Vending Machine
DSW = Dish Washer
CMB = Combi Boiler
PRU = Pressurisation Unit
DL = Dead Leg
EWC = Electronic Water Conditioner
DWT = Drinking Water Tap
FC = Fume Cupboard
CDU = Chemical Dispensing Unit
HWSV = Hot Water Storage Vessel

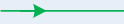
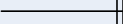




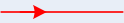





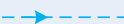


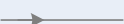


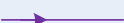


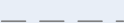





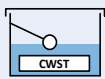



















































8. LINE DRAWINGS OF WATER SYSTEMS SITE: Wyvern Barracks - Building 7

NB: Due to the complexity of the pipe work at this site it is not possible to ensure the total accuracy of these line drawings. They may require revision.

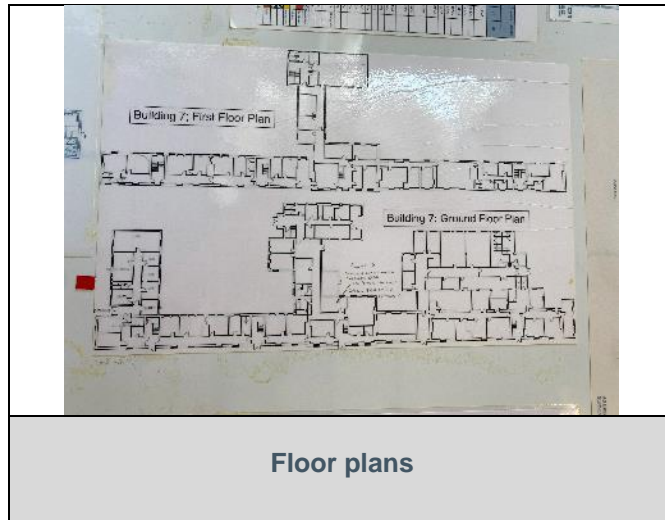




SCHEMATICS KEY

	Mains Cold Water		Dead-end		Humidifier
	Tanked Cold Water		Dead-leg		Drinking Water Chiller Unit
	Hot Water Supply		Incoming Mains Stop Valve		Vending Machine
	Bore Hole Cold Water		Isolation Valve		Hot Water Boiler
	Soft Water		Isolation Valve (closed)		Coffee Maker
	Grey/Recycled Water		Solenoid Valve		Dishwasher
	Chemical Dosing Line		Single non-return (check) Valve		Washing Machine
	Room/Floor Border		Double non-return (check) Valve		Sluice Cistern
	Incoming Supply		Reduced Pressure Zone Valve (RPZ)		Sluice Machine
	Cold Water Storage Tank		Pressure Reducing Valve		Waste Disposal Unit
	Hot Water Storage Vessel		Pump		Potato Peeler
	Combination Water Heater		Thermostatic Mixing Valve (TMV)		Ice Making Machine
	Combi Boiler		Thermostatic Mixer Tap (TMVT)		Steamer
	High Storage Water Heater		Thermostatic Shower		Combi Steam Oven
	Low Storage Water Heater		Mixer Shower		Pressure Gauge
	Instantaneous Water Heater		Electric Shower		Temperature Gauge
	Plate Heat Exchanger		Cold Only Shower		Water Meter
	Strainer		Emergency Shower with Integral Header Tank		Heating Pressurisation unit
	Inline Filter		Emergency Shower		Chilled Water Pressurisation Unit
	Ultra Violet Lamp		Emergency Eye Wash		Mains cold Nearest sentinel point
	Water Softener		Hydro Tap		Mains cold furthest Sentinel point
	Expansion Vessel		Fire Hose Reel		Mains cold Multipoint sentinel
	Feed and Expansion Tank				Tanked cold Nearest sentinel point
					Tanked cold Furthest sentinel point
					Tanked cold Multipoint sentinel
					Borehole Nearest sentinel point
					Borehole Furthest sentinel point
					Borehole Multipoint sentinel
					Hot water Nearest sentinel point
					Hot water Furthest sentinel point
					Hot water Multipoint sentinel
					Toilet
					Urinal
					Wash hand basin

9. OTHER PHOTOGRAPHS



10. ASSET REGISTER SUMMARY

Asset:	Asset Number of:
Outlets	31
Sentinel outlets	10
Infrequently used outlets	Guided by site
Cold Water Storage Tanks	0
Hot Water Storage Vessel	0
Plate Heat Exchangers	0
Combi Boilers	0
Point of Use Water Heaters - >15 Litres	0
Point of Use Water Heaters - <15 Litres	6
Instantaneous Water Heaters	17
Combination Water Heaters (Fortic style)	0
Combination Water Heaters with Storage (FBM style)	1
Water Softeners	0
Showers	4
Rinse Hoses	0
Spray Outlets	0
TMVs	1
TMTs	0
Strainers	0
Flexible Hoses	2
Expansion Vessels	2
Pumps	
RPZ Valve	

11. Water Treatment & Hygiene Experience and Training Details

All personnel undertaking water treatment and hygiene works must only be carrying out their duties if they are suitably qualified, trained and competent to do so. Details of the assessor for this risk assessment are recorded below:

Persons name:	Jon Barton
Job description:	Legionella Risk Assessor/consultant
Company:	Aquastat
Experience:	Working in the industry since 2011
Qualifications:	BSRIA pre-commissioning flushing course (March 2013)
	Risk Assessments of Water Systems (WMS October 2014)
	Level 2 Diploma in Plumbing Studies (City & Guilds 2013-2014)
	Practical Legionella Risk Assessment (advanced) (WMS June 2015)
	Risk Assessing Cooling systems (WMS May 2017)
	Chlorine Dioxide training course – January 2019
	Legionella and the Law (WMS online course, April 2022)
	Legionella Causes and Impacts of Infection (WMS online course, April 2022)
	Evaporative Cooling Water Chemistry Foundation (WMS April 2022)

Certification for all the above are held at Aquastat offices.

12. Legislation and Codes of Practice

References

- 1 *Health and Safety at Work etc Act 1974 (c.37)* The Stationery Office 1974 ISBN 978 0 10 543774 1
- 2 *Control of substances hazardous to health (COSHH). The Control of Substances Hazardous to Health Regulations 2002 (as amended). Approved Code of Practice and guidance L5 (Sixth edition)* HSE Books 2013 ISBN 978 0 7176 6582 2
www.hse.gov.uk/pubns/books/l5.htm
- 3 *The Management of Health and Safety at Work Regulations 1999* SI 3242/1999 The Stationery Office
- 4 *Reporting accidents and incidents at work: A brief guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)* Leaflet INDG453(rev1) HSE Books 2013 www.hse.gov.uk/pubns/indg453.htm
- 5 *The Notification of Cooling Towers and Evaporative Condensers Regulations 1992* SI 1992/2225 The Stationery Office
- 6 *Consulting employees on health and safety: A brief guide to the law* Leaflet INDG232(rev2) HSE Books 2013
www.hse.gov.uk/pubns/indg232.htm
- 7 *Legionnaires' disease: A guide for duty holders* Leaflet INDG458 HSE Books 2012 www.hse.gov.uk/pubns/indg458.htm
- 8 *Managing for health and safety* HSG65 (Third edition) HSE Books 2013 ISBN 978 0 7176 6456 6
www.hse.gov.uk/pubns/books/hsg65.htm
- 9 *The control of legionella: A recommended Code of Conduct for service providers* The Legionella Control Association 2013
www.legionellacontrol.org.uk
- 10 *Water fittings and materials directory* Water Regulations Advisory Scheme www.wras.co.uk/Directory
- 11 *Water Supply (Water Fitting) Regulations 1999* SI 1148/1999 The Stationery Office

Further reading

- BS 8580-1 2019 *Water quality. Risk assessments for Legionella control. Code of practice* British Standards Institution
- BS 8558:2015 *Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages* British Standards Institution
- BS EN 806 (Parts 1-5) *Specifications for installations inside buildings conveying water for human consumption* British Standards Institution
- Water systems: Health Technical Memorandum 04-01: Safe water in healthcare premises.*
- Code of Practice: Cooling water treatment* Water Management Society 2007 www.wmsoc.org.uk
- Getting specialist help with health and safety* Leaflet INDG420(rev1) HSE Books 2011
www.hse.gov.uk/pubns/indg420.htm
- Minimising the risk of Legionnaires' disease* TM13 The Chartered Institution of Building Services Engineers 2013

Doc: AWRA1 -Appendix A

SUMMARY OF THE APPROVED CODE OF PRACTICE L8 (revised) and
HSG274 Parts 1, 2 and 3 FOR THE PREVENTION
OR CONTROL OF LEGIONELLOSIS

Any water system operating with temperatures of greater than 20C and which may release a spray or aerosol presents a reasonably foreseeable risk of Legionellosis. Experience shows that the following are the key systems, which required attention.

- **Systems incorporating cooling towers or evaporative condenser.**
- **Hot water services**
- **Humidifiers and air washers.**
- **Spa baths and pools.**
- **Hot and cold water services in premises where the occupants are particularly susceptible.**

For premises covered by the Health and Safety at Work Act 1974, the HSC's Approved Code of Practice requires the following:

- **A risk assessment undertaken by a competent person to identify the risk of Legionellosis and any necessary and reasonably practicable precautionary measures required.**
- **A management plan identifying steps to be taken to minimise the risk. The plan should also identify the responsible persons, the lines of communication and the training and competence requirements for employees and sub-contractors.**
- **Implementation of the plan including training.**
- **Record keeping to track remedial activities and to monitor performance.**
- **The owner should ensure that the management system performance is audited and subject to management review to keep it relevant.**

The following list provides an indication of the requirement of the ACOP, which is enforced by the Health and Safety Executive or the Environmental Health Department of the local authority, depending on your premises type. Failure to comply is not in itself an offence, but failure to comply may be taken by a court as proof that the person has contravened the legal requirements.

- * **Risk Assessments**
- * **Management plan and procedure development**
- * **Training of personnel**
- * **Remedial action such as**
 - **cleaning and disinfection**
 - **Tank refurbishment**
 - **Regular water treatment (chemical/plant)**
- * **Provision of log books**
- * **Regular monitoring and system maintenance including sampling analysis, chemical cleaning and disinfection.**

Doc: AWRA2 -Appendice B

THE CONTROL OF LEGIONELLOSIS L8 SUMMARY FOR HOT & COLD-WATER SERVICES

L8 (Revised) and HSG274 Parts 1, 2 and 3 applies to all premises covered by the Health and Safety at Work Act 1974, where foreseeable risk of Legionellosis is present i.e. most commercial premises with a hot and cold water system

The prime focus of this document is to avoid conditions that permit Legionellae to proliferate and to avoid the creation of sprays or aerosols or where this is impracticable to minimise the release of droplets.

The conditions that promote legionellae proliferation are:

- **Temperatures in the range of 20 - 45 C**
- **Presence of sediment, sludge, scale or organic matter which act as nutrients.**
- **Some unapproved water fittings may harbour legionella and act as a nutrient.**
- **High microbial levels may act as nutrients and as a host for legionellae.**
- **Biofilms and slimes may harbour and protect Legionellae from biocides. These are often caused by stagnant or low flow conditions.**

The main areas of concern for hot and cold water services are shown in Table (1) along with some possible precautionary measures. A risk assessment should be carried out on each site and a management plan developed to minimise the risk. The management plan and its execution should be completely documented as detailed in Table (2).

TABLE 1 - TYPICAL RISKS IN HOT AND COLD WATER SERVICES

ITEM	POSSIBLE PROBLEM	OPTIONS & PRECAUTIONARY MEASURES
Storage Tank	Stagnation Temperature > 20°C Sludge and Scale build up Corrosion deposits build up Ingress of nutrients	Location of inlet and outlet Ensure tanks not too large or numerous Insulation, or low level chlorination Clean and disinfect on regular basis Refurbishment/Butyl lining Tight fitting covers and insect mesh on overflow
Softeners & Filters	Deposit builds up Microbiological build up Fitting harbouring legionella	Backwash regularly Disinfect 6 monthly or as monitoring requires Use approved fittings only
Calorifiers	Stratification (temp < 60°C) Intermittent use Scale builds up	Pumped circulation or regular thermal Disinfection Thermal disinfection Pre-treat water or descale as required
Dead legs (e.g., taps, showers and other appliances)	Fittings harbouring legionella Stagnation	Use approved fittings only Chlorination and flush through Thermal disinfection and flush through Keep pipe runs short
All pipework and systems	Sludge, Scale, Debris build up	Clean and disinfect on a regular basis Regular microbiological monitoring (e.g. Dip-slide 4 - 6 per annum Legionella sampling annually

RECORDS FOR HOT AND COLD-WATER SERVICE

A log book with the following contents is recommended: -

- **Identification of those responsible and lines of communication.**
- **Description and plan of the system.**
- **Risk Assessment.**
- **Operation of the system.**
- **Procedures for inspection and checking of the system.**
- **Management plan of remedial activities and records of progress.**
- **Records of:**
 - Water temperatures**
 - Record of operation, maintenance and checking**
 - Inspection record and subsequent action.**
 - Cleaning and disinfection record**