"WATER SAFETY PLAN"

Incorporating *Legionella* "safe" hot water, cold water, drinking water and ventilation systems Management and Control

BOOK 4

CONTINGENCY MEASURES

This document was formally approved by The University Health and Safety Committee on:

Date 17th June 2016

Name: David Howell Director of Facilities Services

Signed: .....

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i. DISTRIBUTION CONTROL

This Water Safety Plan (WSP) has a controlled circulation and should not be copied or circulated without the permission of the Water Safety Group (WSG) Chair.

Confirmation that each Departmental Responsible Person and their Deputy have read and understood this WSP and recorded on each 'Letter of Nomination' enclosed in Appendix 1. While the WSG have delegated responsibility to department leads and framework contractors to ensure that information contained herein is disseminated to all appropriate parties; including at induction via specific instruction to work to the WSP.

DOCUMENT MANAGEMENT

Whilst this document is developed in such a way as to ensure that all aspects of Water Quality Management are addressed, its construction is such as to allow for ease of use and it is thus divided into the following sections which can be considered in isolation:

Document No.	Document Title	Targeted Departments						
		FM Services		H&S	Schools & Sports	Contractors	Commercial	Imago & Campus Services
		Hard FM	Soft FM					
Book 1	General Considerations	✓	✓	✓	✓	✓	✓	✓
Book 2	FM Services Management	✓	✓	✓	✓	✓	✓	✓
Book 3	Projects & Capital Management	✓	✓	✓		✓		
Book 4	Contingency Measures	✓	✓	✓	✓		✓	✓

NB - Hard FM Services are related to Building mechanical and electrical services. While Soft FM Services are related to but not limited to cleaning, catering, accommodation, security, landscaping, waste management.

This WSP shall be used in conjunction with current version of the following University Policies:

i. Domestic Services

http://www.lboro.ac.uk/services/fm/services/domestic/

ii. General Sport Policy –

http://www.lboro.ac.uk/departments/ssehs/research/social-sciences-and-sport/sport-policy-and-management/

iii. Catering equipment and Irrigation systems (Grounds and Gardening) –

http://www.lboro.ac.uk/services/fm/services/grounds/

iv. H&S policy –

http://www.lboro.ac.uk/services/fm/services/fmhs/policies/

v. Capital Specifications –

1. CONTINGENCY MEASURES

1.1 Higher than recommended CWS temperatures:

Results Interpretation and Specific Action Required: The information below is meant to indicate some possible causes and suitable remedial action and shall not be considered exhaustive. Each failure must be considered in detail and the causes suitably addressed.

Result	Possible cause	Remedial Action
Mains >20°C	1. High ambient temperatures	• Consider on-line disinfectant to augment and negate temperature control as primary bacterial control method. • Increase water through-put by *strategic flushing to reduce water retention time. • **Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of increased CWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document. • When temperature exceeds 20°C ***persistently; increase frequency of biological sampling (*E. coli*, coliforms and TVCC) to MONTHLY to ascertain effect of increased CWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
Tank temperature greater than Mains temperature	1. Tank over capacity	• Reduce stored water capacity to reduce water retention time. • Increase water through-put by strategic flushing to reduce water retention time. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of increased CWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	2. Lack of adequate tank insulation	• Install or improve tank insulation.
	3. High tank room temperatures	• Increase tank room ventilation.
Outlet temperatures greater than mains/tank temperatures	1. Areas of "low-flow" or dead-legs in the system and lack of adequate use causing stagnation	• Increase water through-put by strategic flushing to reduce water retention time. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of increased CWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	2. Lack of adequate insulation	• Install or improve pipework insulation.
	3. Heating pipes in close proximity to CWS pipes	• Increase insulation • Consider relocation of CWS/heating pipes if practicable. • Consider on-line disinfectant to negate temperature control as primary bacterial control method. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of increased CWS

		temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.

*Strategic flushing comprises of the introduction of flushing of all identified infrequently used outlets and also of outlets which are suitably located on the system to enable the thorough and speedy purging of the CWS to allow for the reduction of water temperatures to within recommended limits.

**Biological sampling must be carried out as described in WSP Book 2 –Process No. 1 'Microbiological sample collection protocol'. On receipt of biological analysis results, follow the procedures described in Section 1.5 – 1.8 Result Interpretations and appropriate actions".

***Persistently indicates that measured temperature exceeds 20ºC between at least two consecutive temperature monitoring visits.

1.2 Lower than recommended HWS temperatures:

Results Interpretation and Specific Action Required: The information below is meant to indicate some possible causes and suitable remedial action and should not be considered exhaustive. Each failure must be considered in detail and the causes suitably addressed.

Result	Possible cause	Remedial Action
Stored and/or Flow temperatures <60°C	1. Low "Set" temperatures for hot water generation of <60°C	• Increase temperature to ≥60°C. • If temperature <50°C (<55°C in Clinical Areas) in ", and has been such for >4 hours, carry-out pasteurisation of vessel. • Pasteurisation shall also be carried out when the stored water temperature falls below 45.0°C for more than 1 hour before the Calorifier or buffer vessel is returned to service. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of decreased HWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	2. Thermostat failure	• Replace thermostat. • If temperature <50°C (<55°C in Clinical Areas), and has been such for >4 hours, carry-out pasteurisation of vessel. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of decreased HWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document
	3. Primary heating supply isolated	• Employ heating supply. • Carry-out pasteurisation of vessel before use. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of decreased HWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	4. Primary heating failure	• Repair primary heating supply. • Carry-out pasteurisation of vessel before use. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of decreased HWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	5. Generation units under-rating/under capacity	• Consider capacity vs demand and replace unit with more suitably sized vessel. • Carry-out pasteurisation of replacement vessel prior to being put into service.
	6. Temperature taken with contact probe	• Obtain 'direct' temperature, using calibrated thermometer, from ideally located sampling point and reconsider results.
	7. Gauges and/or BMS temperature monitoring points not calibrated	• Calibrate all gauges and/or BMS monitoring points and reconsider results.
Return temperature <50°C when Flow	1. Distribution system short circuiting	• Carry out investigation of distribution pipe-work to locate possible short-circuit.

temperature >60°C	2. Circulation pump under rated	• Upgrade circulation pump to a suitable rating. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of decreased HWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	3. Circulation pump faulty	• Replace/repair circulation pump.
	4. Temperature measurement taken down stream of cold supply	• Re-measure temperature from location upstream of cold supply.
	5. Temperature taken with contact probe	• Obtain 'direct' temperature, using calibrated thermometer, from ideally located sampling point and reconsider results.
	6. Gauges and/or BMS temperature monitoring points not calibrated	• Calibrate all gauges and/or BMS monitoring points and reconsider results.
Distribution temperatures <55°C when Flow temperature >60°C	1. Excessive heat loss.	• Inspect HWS and CWS insulation and upgrade where practicable. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of decreased HWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	2. "non-returned" pipe spurs	• Inspect the length of non-returned spurs and rectify by relocating HWS Return to within 300mm (or up to 500mm if there are existing constraints) of point of delivery if practicable.
	3. Areas of "low-flow" or dead-legs in the system	• Increase water through-put by strategic flushing to reduce water retention time. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of decreased HWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	4. Presence of space-heating apparatus on the HWS system	• Investigate the presence of heat loss due the presence of space heating (towel rails, linen cupboard heaters, etc.) and remove from the system. • Carry out biological sampling (TVCC) to ascertain effect of decreased HWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	5. Failure of Trace Heating system or Trace Heating system not extending to extremities of the system.	• Inspect the Trace heating system and repair/replace if necessary or extend system to allow for temperature maintenance to system spurs. • Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of decreased HWS temperatures. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.

*Strategic flushing comprises of the introduction of flushing of all identified infrequently used outlets and also of outlets which are suitably located on the system to enable the thorough and speedy purging of the HWS to allow for the reduction of water temperatures to within recommended limits.

**Biological sampling must be carried out as described in WSP Book 2 –Process No. 1 'Microbiological sample collection protocol'. On receipt of biological analysis results, follow the procedures described in Section 1.5 – 1.8 Result Interpretations and appropriate actions".

***Persistently indicates that measured temperature below 50°C (<55°C in Clinical Areas) between at least two consecutive temperature monitoring visits.

1.3 Dead-legs and areas of infrequent use:

Results Interpretation and Specific Action Required: The information below is meant to indicate some possible causes and suitable remedial action and should not be considered exhaustive. Each failure must be considered in detail and the causes suitably addressed.

Result	Remedial Action
Notification of dead-legs	1. Remove dead-leg by cutting it back to the main distribution pipe-work ensuring that 'T' piece is removed where practicable. 2. Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of the dead-leg. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
Notification of Low and Infrequently Used outlets	1. Increase water through-put by the introduction of scheduled strategic flushing to reduce water retention time. 2. Consider the removal of the outlet – following approval from WSG and FM Responsible Person. 3. Carry out biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of the dead-leg. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
General	1. Ensure that all users are advised on the potential risks and appropriate actions required to prevent the likelihood of proliferation and exposure to Legionella bacteria in infrequently used/disused outlets. 2. Ensure that the users undertake flushing of all identified infrequently used outlets on a Weekly (more frequently if required) basis as described in WSP Book 2_Process No. 9 'Dead Legs/Areas of Low Usage Evaluation and Flushing' 3. Where infrequently used facilities are deemed to be no longer required, they should be reported to FM for removal – following approval from H&S.

*Biological sampling must be carried out as described in WSP Book 2 –Process No. 1 'Microbiological sample collection protocol'. On receipt of biological analysis results, follow the procedures described in Section 1.5 – 1.8 Result Interpretations and appropriate actions"

1.4 Lower and/or higher than recommended ClO2 and Chlorine (M101) levels:

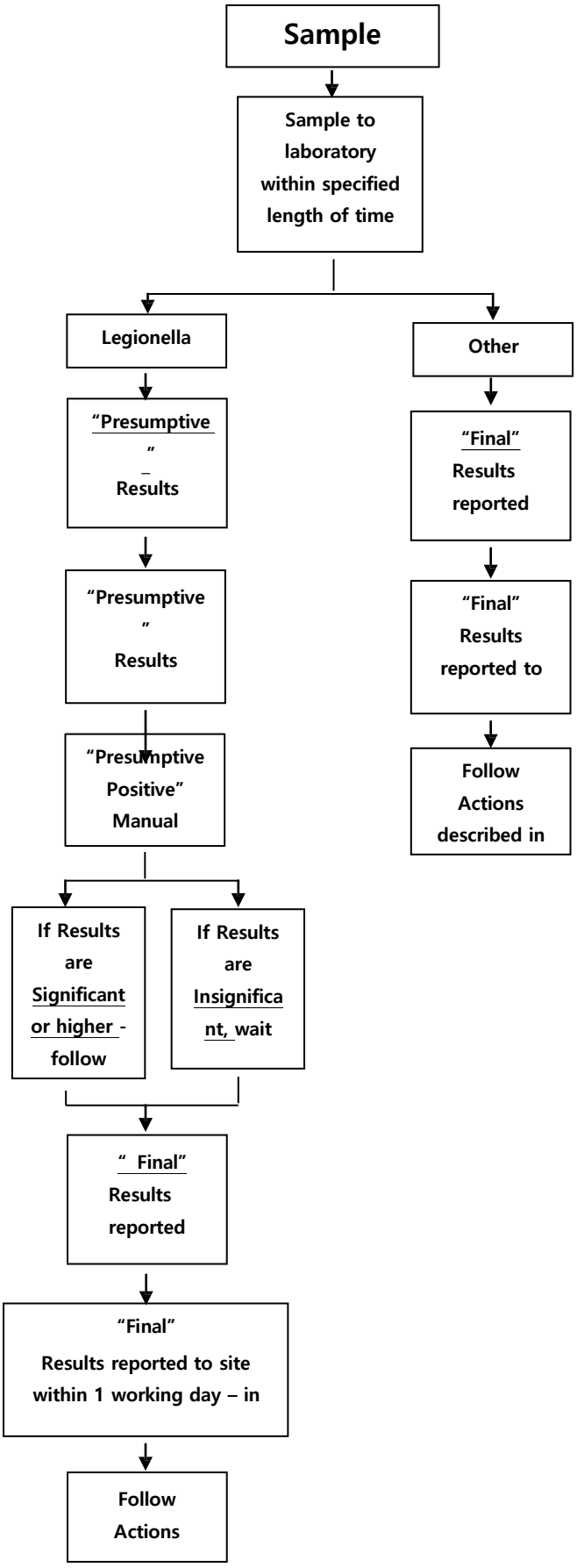
Results Interpretation and Specific Action Required: The information below is meant to indicate some possible causes and suitable remedial action and should not be considered exhaustive. Each failure must be considered in detail and the causes suitably addressed.

Result	Possible cause	Remedial Action
<0.25ppm at dosing point – CL02 <0.6ppm at dissolver tank – M101	1. Chemical(s) levels depleted	• Check chemical(s) levels and top-up if depleted. • If lower than recommended levels persist for more than three days, carry out *biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of the lower than recommended levels. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	2. Dosing equipment malfunctioning	• Check operating status of dosing equipment and contact service provider if found to be malfunctioning. • If lower than recommended levels persist for more than three days, carry out *biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of the lower than recommended levels. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
>0.8ppm at dosing point – CLO2 >1ppm at dissolver tank – M101	1. Dosing equipment malfunctioning	• Isolate dosing equipment to disable further dosing of chemical. • Check operating status of dosing equipment and contact service provider if found to be malfunctioning. • Purge the system thoroughly until chemical level falls to within the recommended limits. • Check random strainers/aerators for signs of significant biofilm contamination. • If higher than recommended levels persist for more than three days, carry out *biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of the higher than recommended levels particularly to ascertain the potential of increased biofilm shearing. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
<0.1ppm at sentinel outlet <0.33ppm at sentinel outlet – M101	1. Chemical(s) levels depleted	• Check chemical(s) levels and top-up if depleted. • If lower than recommended levels persist for more than three days, carry out *biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of the lower than recommended levels. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
	2. Dosing equipment malfunctioning	• Check operating status of dosing equipment and contact service provider if found to be malfunctioning. • If lower than recommended levels persist for more than three days, carry out *biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of the lower than recommended levels. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.

	3. Areas of "low-flow" or dead-legs in the system and lack of adequate use causing stagnation	• Increase water through-put by strategic flushing to reduce water retention time. • If lower than recommended levels persist for more than three days, carry out *biological sampling (*E. coli*, coliforms and TVCC) to ascertain effect of the lower than recommended levels. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.
>0.5ppm at sentinel outlet – CLO2 >0.8ppm at sentinel outlet – M101	1. Dosing equipment malfunctioning	• Isolate dosing equipment to disable further dosing of chemical. • Check operating status of dosing equipment and contact service provider if found to be malfunctioning. • Purge the system thoroughly until chemical level falls to within the recommended limits. • Check random strainers/aerators for signs of significant biofilm contamination. • If higher than recommended levels persist for more than three days, carry out *biological sampling (*E. coli,* coliforms and TVCC) to ascertain effect of the higher than recommended levels particularly to ascertain the potential of increased biofilm shearing. Upon receipt of results, follow protocol described in Section 1.5 – 1.8 of this document.

**Biological sampling must be carried out as described in WSP Book 2 –Process No. 1 'Microbiological sample collection protocol'. On receipt of biological analysis results, follow the procedures described in Section 1.5 – 1.8 Result Interpretations and appropriate actions".

1.5. Results Reporting – How Am I Told About The Results?



1.6 Water microbiological water analysis sample results interpretation:

Analysis Sample	Reported Results	Result Interpretation
Aerobic count TVCC	None Detected	Negative
	10cfu/ml – 100cfu/ml	Insignificant
	100cfu/ml – 1,000cfu/ml	Significant
	>1,000cfu/ml	Highly Significant
Legionella sp.	None Detected	Negative
	<100cfu/l	Insignificant
	100cfu/l – 1,000cfu/l	Significant
	>1,000cfu/l	Highly Significant
Coliforms and *E. coli*	None Detected	Negative
	<1cfu/100ml	Negative
	≥1cfu/100ml	Highly Significant

1.7 Microbiological analysis results

Guidance Note 1: *The information below is meant to indicate some possible causes of the reported contamination and suitable remedial action and must not be considered exhaustive or prescriptive. Each failure must be considered in detail and the causes suitably addressed. It is important, therefore, that all identified Legionella contamination, irrespective of species, serogroup, level of contamination and whether isolated from a pre- or post-flush sample must be notified to H&S immediately upon receipt of sample results as a more bespoke approach to risk management maybe needed. In addition, a local risk assessment shall be carried out following specific requests from the University's Health and Safety Team. The purpose of the Local Risk Assessment is to carry out a detailed coordinated assessment of the students, staff, environment and water system in an area where Legionella contamination has been identified in the domestic water system. The Risk Assessment shall consider the maintenance records for the area, flushing records and also investigate the water systems in the area to identify the underlying cause of the problems and set out the remedial action necessary to address the threat. In addition an assessment of the students or staff shall be carried out so that appropriate measures are taken to protect any students or staff that may be considered to be susceptible to infection. A Local Risk Assessment is a team exercise that requires the input from the appropriate members of the WSG. The outcomes of Local Risk Assessments shall be considered by the WSG to identify any "Lessons Learned" from the incident.*

SAMPLE RESULT				
Sample Result	**PRE–FLUSH SAMPLES**		**POST–FLUSH SAMPLES**	
	Interpretation	**Remedial Action**	**Interpretation**	**Remedial Action**
Negative	N/A	• No action required. • Consider the Post-flush results and action accordingly where required.	N/A	• No action required. • Consider the Pre-flush results and action accordingly where required.
Insignificant	Insignificant levels of localised contamination only, if in the absence of positive post flush sample results.	• Flush outlet and review 'Usage Evaluation and Flushing' records and action accordingly. • Clean and disinfect all aerators and flow straighteners. Renew where required. Consider their permanent removal. • No re-sample required. Put outlet back in-use. • Consider the Post-flush results and action accordingly where required. • Review Management & Control Programme to ensure adequate and correct implementation. • H&S to provide advice on the requirement to re-sample and installation of POU filters in high risk student/staff areas (where practicable).	Insignificant levels of systemic contamination, if in the presence of other post flush positive sample results.	• If found in the absence of others (in the majority) post flush +ves; clean and disinfect all aerators and flow straighteners associated with outlets which return +ves. Renew where required. Consider their permanent removal. • No re-sample required. Put outlet back in-use. • If found in the presence of other (in the majority) post-flush +ves, carry out remedial action as described above and thoroughly and repeatedly flush the whole system and carry out Re-sample. If this is a repeat +ve result, widen the sample locations schedule to ascertain extent of contamination. • On the advice of H&S and Engineering; consider system disinfection and re-sample, no earlier than 48 hrs after the disinfection process. • H&SWSG members to provide advice on the requirement to re-sample and, where possible, to install POU filter and put outlet back in-use whilst awaiting re-sample results. Where the installation of POU filter is not possible, keep outlet out-of-use but continue to flush on a daily basis whilst awaiting for the results. • Review Management & Control Programme to ensure adequate and correct implementation.

Sample Result	PRE–FLUSH SAMPLES		POST–FLUSH SAMPLES	
	Interpretation	Remedial Action	Interpretation	Remedial Action
Significant	Significant levels of localised contamination only if in the absence of positive post flush sample results.	• Where practicable and applicable, clean and disinfect outlet, associated aerators and flow straighteners and TMV strainers. Renew where required. Consider their permanent removal. • Flush outlet and review 'Usage Evaluation and Flushing' records and action accordingly • Consider the Post-flush Carry out Re-sample no earlier than 48 hrs after the clean and disinfection. If this is a repeat +ve result, widen the sample locations schedule to ascertain extent of contamination results and action accordingly where required. • Where possible, install POU filter and put outlet back in-use whilst awaiting re-sample results. Where the installation of POU filter is not possible, keep outlet out-of-use but continue to flush on a daily basis whilst awaiting for the results. • Review Management & Control Programme to ensure adequate and correct implementation.	Significant levels of systemic contamination, if in the presence of other post flush positive sample results.	• If found in the absence of others (in the majority) post flush +ves; clean and disinfect all aerators and flow straighteners. Renew where required. Consider their permanent removal. • Carry out Re-sample, no earlier than 48 hrs after the clean and disinfection. If this is a repeat +ve result, widen the sample locations schedule to ascertain extent of contamination. • If found in the presence of other (in the majority) post-flush +ves, carry out remedial action as described above and carry-out system (including all source units) disinfection and re-sample (including from the incoming mains and all source units,, no earlier than 48 hrs after the disinfection process. If this is a repeat +ve result, widen the sample locations schedule to ascertain extent of contamination. • H&S/ WSG to provide advice on the requirement to install of POU filters in high risk areas, of if the installation of POU filters is not possible keep outlet out of use and flush daily, whilst waiting for the results of the re-samples. • Review Management & Control Programme to ensure adequate and correct implementation. • If persistent post-flush +ves, consider the installation of an on-line disinfection system capable of controlling bacterial contamination independent to temperature control requirements.
Highly Significant	Highly Significant levels of localised contamination only if in the absence of positive post flush sample results.	• Take outlet out of use immediately. **(CONFIRMATION VIA MANAGEMENT AND WSG CHAIR).** • Where practicable and applicable, clean and disinfect outlet, associated aerators and flow straighteners and TMV strainers. Renew where required. Consider their permanent removal. • Flush outlet and review 'Usage Evaluation and Flushing' records and action accordingly. • Consider the Post-flush results and action accordingly where required. • Carry out Re-sample no earlier than 48 hrs after the clean and disinfection. If this is a repeat +ve result, widen the sample locations schedule to ascertain extent of contamination. • Where possible, install POU filter and put outlet back in-use whilst awaiting re-sample results. Where the installation of POU filter is not possible, keep outlet out-of-use but continue to flush on a daily basis whilst awaiting for the results. • On the advice of H&S, continue to keep outlet out-of-use until –ve results received from re-sample results in high risk areas. • Review Management & Control Programme to ensure adequate and correct implementation.	Highly significant levels of systemic contamination, if in the presence of other post flush positive sample results.	• Take outlet out of use immediately **(CONFIRMATION VIA MANAGEMENT AND WSG CHAIR).** • If found in the absence of others (in the majority) post flush +ves; clean and disinfect all aerators and flow straighteners. Renew where required. Consider their permanent removal. • Carry out Re-sample no earlier than 48 hrs after the clean and disinfection. If this is a repeat +ve result, widen the sample locations schedule to ascertain extent of contamination. • If found in the presence of other (in the majority) post-flush +ves, carry out remedial action as described above and carry-out system (including all source units) disinfection and re-sample (including from the incoming mains and all source units,, no earlier than 48 hrs after the disinfection process. If this is a repeat +ve result, widen the sample locations schedule to ascertain extent of contamination. • In all high risk areas and on the advice of H&S / WSG, continue to keep system out-of-use until –ve results received from re-sample results in high risk areas, or, again on the advice of H&S and where practicable, install POU filters to allow continued use of the system whilst awaiting for sample results. • Review Management & Control Programme to ensure adequate and correct implementation. • If persistent post-flush +ves, consider the installation of an on-line disinfection system capable of controlling bacterial contamination independent to temperature control requirements.

2. THE COURSE OF ACTION IF AN OUTBREAK OF LEGIONNAIRES' DISEASE IS SUSPECTED

The University will usually be informed of a suspected outbreak of Legionnaires Disease by a member of the University Health and Safety Team or Health and Safety Executive. If an outbreak is suspected, then this Committee will normally work in association with the Public Health Laboratory and the local Medical Officer for Environmental Health to search for the source of the causative organism. This search is a specialist task which involves epidemiological studies and taking water samples for analysis.

The Health and Safety Executive may be involved in the investigation of outbreaks under the Health and Safety at Work Act 1974. Local authority environmental health officers may also be involved.

It is essential that NO ONE drains or disinfects the systems before samples have been taken. The Engineers role is an important one - guiding specialists to the various water systems within the building, and, in particular, to the points from which samples can be taken. Easy access to these sampling points is essential.

An investigation would concentrate upon all potential sources of Legionella infection including:

i. the domestic hot and cold water system distribution;
ii. showers or spray washing equipment;
iii. drainage systems and taps;
iv. whirlpool baths or therapy pools;
v. humidifiers in ventilation systems;
vi. cooling coils in air conditioning systems;
vii. fountains and sprinklers;

To assist in such investigations the University maintenance team of engineers will need to be able to provide details of all associated equipment, its location, technical data, the operating, maintenance and spares information on all the above installations. They must assist by advising the investigating team as to the extent of servicing on the site and locating taps and sample points.

Off-site information will also be required such as whether there has been any local excavation or earth moving works; alterations to water supply systems or drainage systems or any other factors which may have a bearing on the site.

The Water Safety Group is responsible for identifying the cause of infection and will advise on cleaning, disinfection, any engineering modifications and long-term control measures.

3. MAJOR OUTBREAK PLAN

Please refer to the 'Guidance on the Control and Prevention of Legionnaires' Disease in England Technical Paper 1 – Disease Surveillance Date of Issue: August 2010 Document code: LegDisTP1 Version: 01.00

3.1 Introduction:

This plan is largely based on a general Outbreak Control Plan, with a few minor alterations to emphasise issues particularly pertinent to the control of legionella.

Legionella species occur naturally in the environment and are particularly associated with water sources. Outbreaks of human disease can be associated with a particular water source.

However, this plan is limited to the actions that shall be taken if the source of the outbreak is thought to be one of the University properties.

3.2 Definition of an outbreak:

"A legionella outbreak is defined by the Health Protection England (formerly the Public Health Laboratory Service) 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)."

3.3 Detection of an Outbreak:

An outbreak may be detected by a variety of routes and personnel. Public Health staff shall always consider the possibility of an outbreak when dealing with any case of definite or suspected legionella infection.

Any person, whatever their profession, shall contact the Health & Safety Team immediately, if they suspect that an outbreak of legionella infection may be occurring within the University. A member of the Health & Safety and FM Services Teams is available 24 hours a day and can be contacted via the University switchboard.

The Health & Safety Team will investigate the situation and the WSG chair responsible for the site(s) affected will decide whether to instigate the 'Outbreak Control Plan – Legionella'. Discussions with the relevant members of the Legionella and Water Quality Steering Group who will form part of this early fact-finding activity.

It shall be noted that when determining whether an outbreak of legionella infection is occurring, cases may not be confined to students but may also occur in visitors and staff.

3.4 Outbreak Control Plan:

The main objectives of the Outbreak Control Plan are as follows:

- To identify and define at the earliest stage if a legionella outbreak has occurred and if this is associated with the University premises.
- To organise satisfactory communication with appropriate internal and external agencies, students, staff and relatives.
- To identify the source of the infection.
- To stop further spread and prevent its recurrence.

The responsibility for co-ordinating the above objectives, lies with the 'Outbreak Control Team- Legionella'

3.5 Outbreak Control Team (University Incident Team) – Legionella:

The University is a large organisation. A legionella outbreak may affect one or more sites. The relevant personnel for each site affected shall be included in the Outbreak Control Team. Some of the roles detailed below will be filled by the same person e.g. WSG Chair may also be the FM Lead on the Legionella and Water Quality Steering Group.

The Outbreak Control Team must be called together rapidly and will comprise:

Hard and Soft FM Leads – responsible for the site affected
NOTE – Hard FM Services are related to Building mechanical and electrical services. While Soft FM Services are related to but not limited to cleaning, catering, accommodation, security, landscaping, waste management.

- Legionella Steering Group members
- Managerial staff from the site affected
- Occupational Health Doctor/Nurse
- University Engineer(s) – responsible for legionella control at the site affected
- Clinical Risk manager
- Health and Safety Advisor
- Environmental Health Officer

Additional members may be invited to attend the outbreak meeting and may include:

- Senior Accommodation Manager
- Medical records manager
- Consultant from the local Health Protection Agency Laboratory
- Regional Epidemiologist
- Public Relations Officer

Secretarial and clerical support must be made available to the Team and regular reports distributed to all Team members.

3.6 Procedure for Incident Team Meetings

The first Incident Team meeting will be co-ordinated by the FM Lead for the site affected.

The terms of reference of the Team are:

- To investigate the source and cause of the outbreak
- To implement measures necessary to control the outbreak
- To monitor the effectiveness of the control measures
- To provide clear guidelines for communication with students, student relatives, media, staff, other health authority services within and outside the Hospital.

Particular topics that shall be considered by the Team are:

- Detection of the source and implementation of any remedial measures required
- Case definition and detection of cases
- Diagnostic procedures and the effect on the microbiology laboratory
- Treatment of cases and any change in local empirical prescribing policy
- Effect on the normal running of the hospital
- Managing communication with students, staff, public and the media
- Funding of the above activities
- Defining the end of the outbreak
- Future monitoring and control measures

The WSG chair will initially act as chairperson and outbreak co-ordinator. The Team shall decide at the first meeting the roles to be undertaken by each Team member. The chairperson and co-ordinator roles may be reassigned if the Team so wish.

Each member shall keep a daily record of his or her actions in respect of the outbreak and retain them in case the handling of the outbreak is reviewed/challenged later.

It shall be noted that the Estates Team plays a pivotal role in the detection of the source of the outbreak and implementing any remedial measures.

Subsequent meetings will systematically review the outbreak. The need to obtain further assistance shall be formally considered at each meeting. It shall be recognised that regional and national expert support is available for legionella outbreaks and the Team shall make best use of this.

3.7 At the End of the Outbreak

After the outbreak is officially considered over, a final meeting of the Incident Team shall be held to:

- Review the action taken by all participants and to identify any areas for further improvements.

- Recommend if necessary changes which will reduce the chance of recurrence of the outbreak.

3.8 Interim and Final Reports

The Team is responsible for providing any interim reports required by the University, and the final report at the conclusion of the outbreak, which must be signed by:

- FM Leads – responsible for the site(s) affected
- University Engineers – responsible for Legionella control at the site(s) affected
- Health and Safety Advisor

DOCUMENT CONTROL

Issue No	Version	Revised by	Summary of revision	Date of revision
1	v1	DH	Original draft	June 2016
1	v2	DH	Document control element added to rear of book	July 2017
1	V3	DH	General review and minor update	July 2019