Water Safety Plan

Cardiff & Vale University Health Board

Version	Version 2
Date of Original Issue	7th December 2016
Date of Last Review	n/a
Document Owner	Water Safety Group
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CONTENTS

1. DOCUMENT CONTROL

1.1. Authorised Holder

This WSP is owned and managed by the Water Safety Group (WSG) on behalf of the Cardiff & Vale University Health Board. Updates, changes & amendments must be authorised by the chair of the IPC with approval by the WSG. Any changes must be approved by the Health & Safety Committee before issue.

1.2. Review, Change & Issue Register

Version	Details of Review or Change	Date Amended	WSG Chair Approval Date	H&S Committee Approval Date
V1	Original Issue			
V2	Updated Appendix E Flushing Protocol	6-11-17		

2. INTRODUCTION

In accordance with the University Health Board's Policy for the Control of Water Safety, this Water Safety Plan (WSP) sets out how the risks from microbiological and scalding hazards associated with the supply and use of water are assessed, managed and controlled.

Patient exposure to waterborne microorganisms occurs through a variety of sources, including:

- Inhalation of aerosols and breathable water droplets;
- Drinking water;
- Ingestion of ice;
- Ingestion of food prepared using water;
- Skin contact through washing, bathing (inc use of pools) and showering;
- Contact with endoscopes and medical instruments;
- Contact with others (staff, visitors and other patients).

Water safety management is a key aspect of the protection of the health of patients, visitors and staff in accordance with UK health & safety law. This WSP has been written to the following applicable practical guidance:

- Health & Safety Executive (2013) Legionnaires' disease; The control of legionella bacteria in water systems, Approved Code of Practice & Guidance on Regulations (L8)
- Health & Safety Executive (2014) Legionnaires' disease; Part 2 The control of legionella bacteria in hot and cold water systems (HSG 274 Part 2)
- Health & Safety Executive (2013) Legionnaires' disease; Part 3: The control of legionella bacteria in other risk systems (HSG 274 Part 3)
- Department of Health (2006); Water Systems Health Technical Memorandum 04-01: The Control of Legionella, hygiene, "safe" hot water, cold water and drinking water Part A: Design, Installation & Testing
- Department of Health (2006); Water Systems Health Technical Memorandum 04-01: The Control of Legionella, hygiene, "safe" hot water, cold water and drinking water Part B: Operational Management
- Department of Health (2006); Water Systems Health Technical Memorandum 04-01: Addendum; Pseudomonas *Aeruiginosa* – advice for augmented care units
- Department of Health (2009); Water Systems Health Technical Memorandum 01-05: Decontamination in primary care dental practices
- National Health Service (1997); Model engineering specifications D08 Thermostatic mixing valves (Healthcare Premises)
- British Standards Institute (2011): BS8558:2011 Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages – Complimentary guidance to BS EN 806
- British Standards Institute (2010): BS8580:2010 Water Quality – Risk assessments for Legionella Control – Code of Practice
- British Standards Institute (2008): BS7592:2008 Sampling for Legionella bacteria in water systems – Code of Practice
- NHS Estates (1998); 'Safe hot water and surface temperatures; Health Guidance Note
- Thermostatic Mixing Valve Manufacturer's Association (2000); Recommended Code of Practice for Safe Water Temperatures
- Department of Health (2013); Health Building Note 0-09 Infection Control in the Built Environment
- Chartered Institution of Building Services Engineers (2013); TM13:2013 Minimising the risk of Legionnaires' disease

3. GLOSSARY OF TERMS

Approved Code of Practice	(ACOP) A document approved by the Secretary of State giving guidance and technical information to assist in satisfying regulations
Health & Safety Guidance Note	(HSG) A document produced by the HSE to provide guidance in technical areas of health & safety
Health Technical Memoranda	(HTM) Department of Health documents providing healthcare specific advice and guidance relating to building and engineering technologies
Thermostatic Mixing Valve	(TMV) A device that mixes hot and cold water with adjustable limits for the prevention of scalding
Senior Operational Manager	(SOM) A manager with operational and professional responsibility for a range of specialist services
Authorised Person	(AP) A person appointed with key operational responsibility for the specialist service
Authorising Engineer	(AE) An independent professional advisor for the specialist service
Competent Person	(CP) A person authorised by the AP to provide skilled services, installation and/or maintenance
Tradesperson	A person with specialist skills in a trade background
Augmented Care	Where medical or nursing procedures render the patient susceptible to invasive disease from environmental or opportunistic pathogens
Risk	The likelihood of a hazard such as hot water or a legionella causing harm
Legionella	A pathogenic bacteria commonly found in water systems with the potential to cause Legionnaires ' disease or legionellosis through inhalation of contaminated water droplets
Pseudomonas *Aeruginosa*	A pathogenic bacteria commonly found in wet or moist environments with the potential to cause a number of infections in almost any organ or tissue
Scalding	A thermal burn of the skin from contact with hot water
Schematic Drawing	A representative drawing of a water system showing key components and configuration to aid comprehension

4. ROLE OF THE WATER SAFETY GROUP

The Water Safety Group (WSG) is a multidisciplinary group formed from the many departments in this University Health Board with collective and individual responsibilities for the safe provision and use of water. In order for the WSG to function, the following roles must be an integral part of the group and attend regular meetings as well as carry out appointed actions:

- Director of infection prevention and control (DIPC);
- Senior IPC nurse and other members of the IPC team as appropriate;
- Consultant medical microbiologist;
- Food, Water & Environmental Laboratory Representative;
- Senior Operational Manager (SOM) (Estates and Facilities);
- Appointed Responsible Person (Estates and Facilities);
- Authorised Person AP (Water) (Estates and Facilities);
- Authorising Engineer AE (Water);
- Hotel Services Manager;
- Senior nurses from relevant augmented care;
- Senior representative from Sterile Services;
- Estates management representative from Cardiff University;
- Members of relevant external organisations [note]

Note: Relevant external organisations includes persons appointed with responsibility for water safety or in control of premises that are shared or occupied by Health Board staff or patients.

The chair of the WSG will be the DIPC and is responsible for ensuring it monitors and ensures compliance with this Water Safety Plan (WSP). The WSG will always act in an appropriate and timely manner. Individual responsibilities should not be restricted by the need to hold formal meetings.

The WSG is accountable to the Health & Safety Committee and will also provide reports to the Infection Prevention & Control Group (IPCG) and upwards as appropriate to exercise effective governance and assurance.

All matters of water safety and episodes of colonisation or infection thought to be related to water safety issues will be reported by the IPC team to the chair of the WSG, who will be expected to initiate an appropriate investigation.

The WSG will monitor any proposed developments on the design or installation of the use of the premises and their water systems and check that they are:

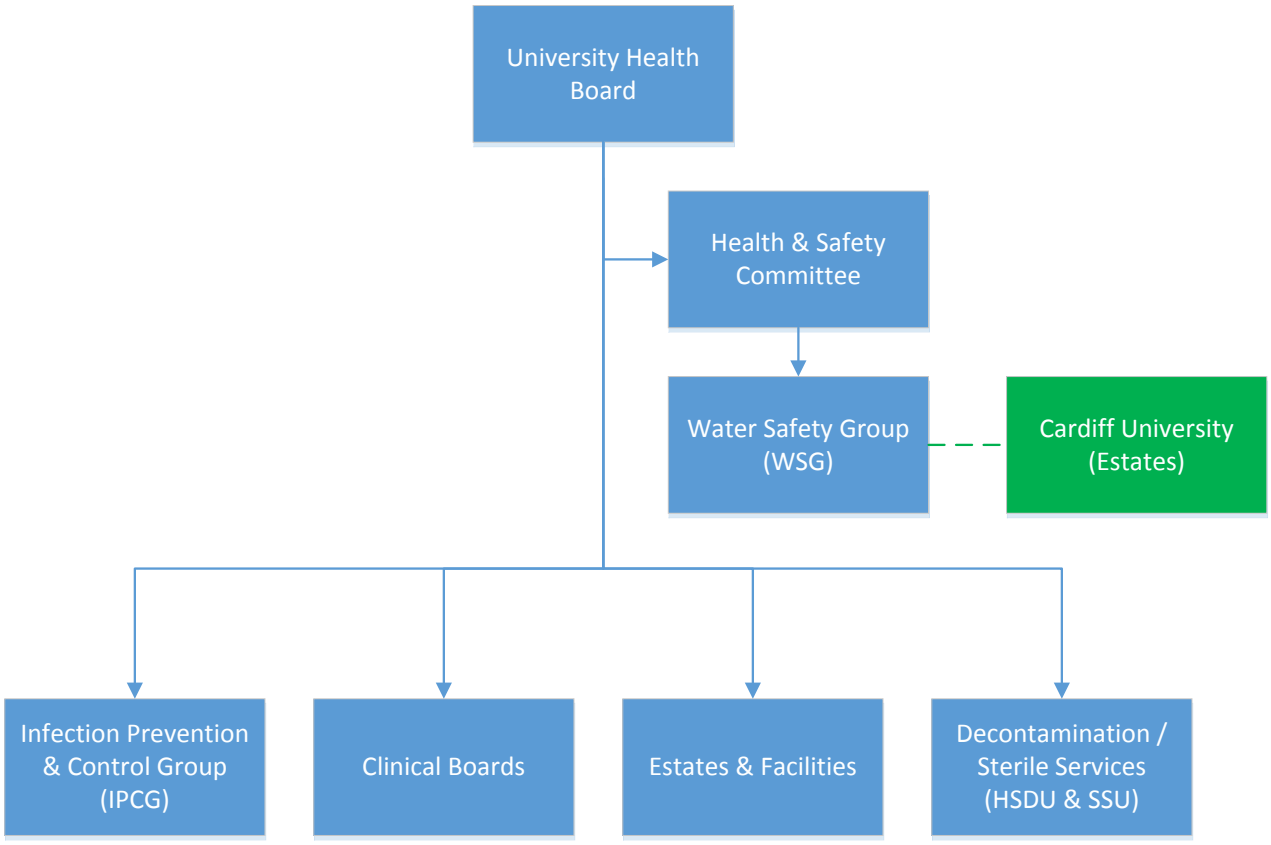
- Ensuring the risk to patients, especially those treated in augmented care settings is minimise and under effective control;
- Compliant with all extant legislation and Department of Health policy and guidance.

All items of equipment that need to be attached to the water distribution system and which may be used in direct care on patients should be approved by the WSG.

The WSG will need to ensure that decisions affecting the safety and integrity of the water system do not go ahead without being agreed by them.

The members and appointments of the WSG group is given in Appendix A.

Water Safety Organisational Relationships:



5. SCOPE

This WSP applies to all premises whether owned or occupied by the University Health Board under lease or other Service Level Agreements (SLA) including:

i. All premises owned and occupied exclusively by University Health Board.
ii. All premises owned and occupied partly by University Health Board.
iii. All premises not owned by University Health Board but maintained and operated by the University Health Board for Cardiff University under a Service Level Agreement
iv. All premises not owned by University Health Board but occupied partly or exclusively by University Health Board on a temporary or permanent basis.

This WSP applies to the control of the risks to health from microbial infection and scalding only – all matters relating to safety of persons in and around water are dealt with separately under direction of the Health & Safety Committee.

Where the management of premises/areas occupied by Health Board staff and/or patients is carried-out by others, the requirements of this WSP remain applicable. Implementation of the specific risk management must be managed locally and ratified by the WSG. It remains therefore, the Health Board's responsibility to ensure that the requirements of this WSP are notified to and complied with by all other parties described above.

This Water Safety Plan does not apply entirely to premises owned by the Health Board but occupied exclusively by others due to the inability to dictate or control health and safety arrangements. The Health Board shall delegate, through legally binding lease agreements, the responsibility for management of water safety risks to the occupier.

Details of all premises and their ownership and occupation status is found in Appendix B.

The scope of this WSP shall extend but not be limited to the water systems given in Appendix C.

The WSG will continue to consider new developments and improvements in the field of Water Quality Management & Control, in order to ensure that the control of the prevailing risks, posed by the systems and operations on its sites, is constantly reviewed and improved and always maintained at the maximum level.

6. AUGMENTED CARE

This WSP applies to all areas of the estate where persons are exposed to potential waterborne hazards, but has particular relevance in areas designated as augmented care.

Augmented care areas are determined as being where medical or nursing procedures render the patient susceptible to invasive disease from environmental or opportunistic pathogens such as *pseudomonas aeruginosa* and Legionella, including:

i. Patients who are severely immunosuppressed because of disease or treatment, including transplant patients and similar patients during high-risk periods in their therapy;
ii. Patients cared for in units where organ support is necessary, including neonatal and adult critical care, renal, respiratory and other intensive care situations;
iii. Patients with extensive breaches in their dermal integrity who require contact with water as part of their continuing care, including burns patients.

The list of augmented care areas, as determined by IPC, is given in Appendix D.

7. DEPARTMENTAL ROLES & RESPONSIBILITIES

The following roles and responsibilities are to be read in conjunction with the Health Board's Policy for the Control of Water Safety.

7.1. Infection, Prevention & Control (IPC)

The principle role of IPC is to monitor and advise on all matters of the prevention of infection, produce policies and procedures to help safeguard patients and staff, and initiate control and emergency measures as necessary. IPC takes the lead role in organising and policing the WSG to ensure that waterborne hazards are managed in accordance with this WSP.

The Director of IPC (DIPC) chairs the WSG and specifically identifies and records areas of the estate that are classified as Augmented Care.

IPC, in conjunction with the Estates AP (Water), determines the need and location for routine sampling of water and produces the Sample Plans. IPC are also the primary recipient of all results of water samples directly from the laboratory, and distributes copies to the AP (Water). Results of concern shall be distributed to and discussed with those concerned to ensure appropriate and timely action is taken in accordance with the principles and procedures of this WSP.

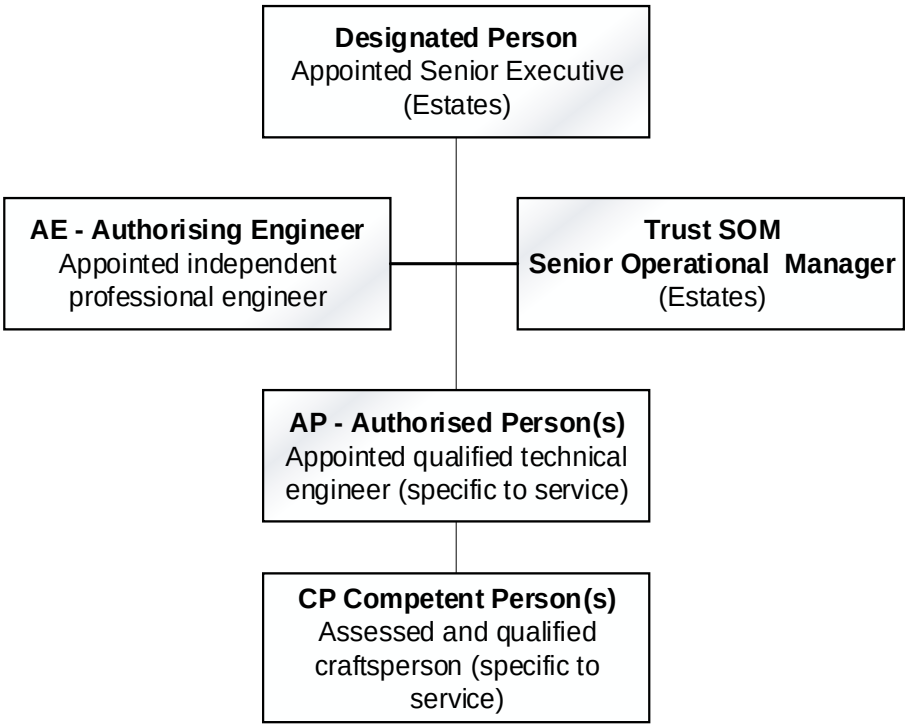
7.2. Estates & Facilities

The principle role of Estates & Facilities is to provide buildings that are safe and fit-for-purpose, including the maintenance of fixed (i.e. not mobile) water systems. The Estates & Facilities Directorate consists of two key functions in relation to water safety management, as follows:

7.2.1. Planning & Capital Engineering – responsible for the design, refurbishment and construction of property including water systems. This department also manages periodic contracts for the implementation of aspects of the legionella control scheme. The obligations within project management for safe design and construction are detailed in this Water Safety Plan.

7.2.2. Operational Maintenance – responsible for the maintenance of water systems, including the implementation of aspects of the legionella control scheme using in-house staff, and all associated corrective actions and remedial works. On occasions, this department will procure the services of specialist water-hygiene / treatment services providers to assist.

Estates & Facilities are almost entirely responsible for the control of legionella in water systems. As a results, the following hierarchy is in place for risk management in accordance with the requirements of WHTM 04-01 and ACOP L8:



Role:	Job Title	Current Appointee:
Designated Person	Executive Director of Planning	Abigail Harris
Trust SOM	Head of Estates & Facilities	Lee Wyatt
AE (Water)	Peninsula Water Hygiene Ltd	Mike Quest
AP Capital Projects	Head of Compliance & Discretionary Capital	Tony Ward
AP Operations - North	Estates Manager (North)	Norman Mitchell
AP Operations - South	Estates & Facilities Manager (South)	Ian Fitsall
CP Operations	Legionella Control Supervisor	Paul Morgan

Procedures and technical standards for ongoing water safety management for the above functions are controlled and issued by the AP (Water), and include the following as a minimum:

- Legionella risk assessments
- Monitoring of legionella controls;
- Cleaning & disinfection of shower heads and hoses and other spray devices
- Testing and maintenance of thermostatic mixing devices
- Maintenance, cleaning and disinfection of other water systems equipment
- Water sampling as directed by the WSG & IPC
- Responding to out of specification results and matters of evident concern
- Investigating and carrying out corrective actions;
- Maintenance of legionella control records;
- Cleaning procedures for clinical wash-hand basins;
- Capital design and project management procedures;
- Engineering technical standards;
- Auditing of water quality controls;

7.3. Clinical Boards & Departments

Clinical boards and their associated departments and wards are responsible for ensuring that all parts of the water system in their area of operation are used in accordance with their design and intent, including the connection and use of specialist equipment in a safe manner.

The Clinical Boards to whom this WSP applies are as follows:

- Medicine
- Surgery
- Mental Health
- Primary Care and Intermediate Care
- Women and Children
- Dental
- Renal
- Specialist Services
- Clinical Diagnostics and Therapeutics

Clinical Boards shall have documented procedures in place that ensure the water used in clinical areas is safe and prevents adverse health effects to patients, staff and members of the public. Key procedures shall be in place relating to use of water and water systems that apply to all clinical boards, as follows:

- Usage evaluation/identification and flushing of little used water outlets[note];
- Risk assessment for the removal of little used outlets;
- Connection of specialist equipment to water supplies;
- Purchasing, installation and maintenance of ice machines;
- Purchasing, installation and maintenance of drinking water coolers.

Note: Refer to section 18 Avoidance of Flushing & Appendix E for standard procedures and records.

7.4. Hospital Sterilisation & Decontamination Unit (HSDU) / Sterile Service Unit (SSU)

The reprocessing of re-useable medical devices excluding endoscopes but including operating theatres, clinics, accident and emergency, maternity and in patient wards is carried out by HSDU at UHW, and SSU at UHL.

Decontamination equipment, including wash-down sinks, washer-disinfectors and autoclaves are supplied with domestic hot and cold water, water treated by Reverse Osmosis (RO) and steam.

Steam is generated on site and supplied to HSDU under the control of Estates, and testing of the steam and condensate is carried out annually by the Estates Decontamination Authorised Person.

The RO plant is managed entirely by HSDU and maintained under a service contract set up by the Estates Department. Treated water from the RO plant (rinse water) is tested weekly and analysed monthly in accordance with strict controls for infection control determined by WHTM 01-01 and WHTM 01-06. Management of testing protocols and records are the responsibility of the Sterile Services Manager.

Endoscopes are re-processed using Automatic Endoscope Re-processors (AER) situated locally in 3 locations at UHW (Theatres, the new Children's Hospital and Outpatients). AERs are supplied with domestic hot and cold water supplies only and each AER is fitted with suitable backflow protection devices. AER are maintained under a service contract set up by the Estates Department, and the responsibility for safe use sits with the Clinical managers of each area, supported by HSDU via the Sterile Services Manager.

Sterile services procedures are strictly managed in accordance with the Health Boards Medical and Management Policy, Decontamination Policy, WHTM 01-01 parts A-E, WHTM 01-06 A Parts A- E and ISO 13485 / 9001.

Safe systems of work (work instructions) are in place for all staff working in the HSDU (UHW) or SSU (UHL) to protect them from risks associated with washing down of contaminated medical devices.

7.5. Specialised Services – Dialysis Technical Services

Water used in dialysis in the hospital is treated on-site to ensure it is safe for application, by a filtration and softening (pre-treatment) and then by reverse osmosis. There are 4 dialysis centres and treatment plant located as follows:

- Main hospital
- Tertiary Tower
- Children's Hospital
- B5 Ward block

Maintenance of the water treatment plant is carried out by specialist contractors and managed by the Estates Department – weekly inspections are carried out by Estates Staff. Sampling of the treated water is undertaken monthly by Dialysis Technical Services staff and records held locally, reporting to IPC and the WSG as appropriate.

7.6. Dental

Dental departments are responsible for the provision and use of safe dental equipment in accordance with HTM 01-05 Decontamination in primary care dental practices. The risks from legionella shall be assessed (by the Estates department) and recommended control measures applied to dental unit water lines (DUWL) and connected equipment including water bottles where

used. Unless otherwise identified, dental staff shall implement controls specific to dental units external to the hot & cold water system, and maintain records accordingly.

Representatives of the Dental department shall report on levels of compliance and problems with controls at regular WSG meetings.

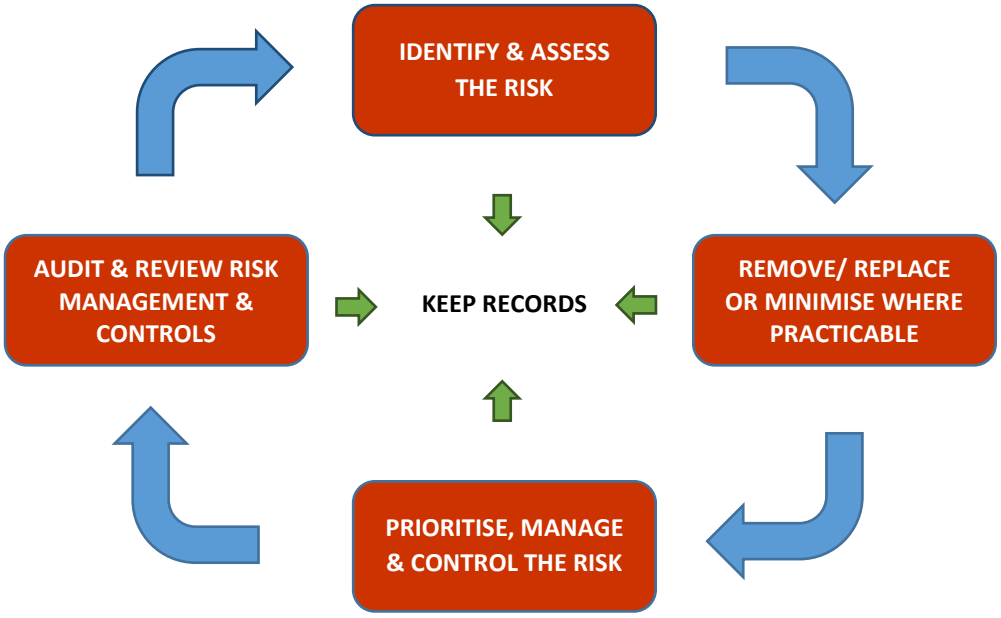
7.7. Cardiff University Estates

Premises owned and managed by Cardiff University but used or occupied by University Health Board staff and/or patients must meet the standards laid out in this WSP and subsequent documents as applicable and as detailed in the University Control of Legionellosis Policy. The University is not required to have arrangements for the management of risks associated with pseudomonas *aeruginosa* due to the absence of augmented care areas and patients.

The University Estates department shall be represented on the WSG and shall make available all records for the verification of compliance as and when required in relation to areas and persons under the duty of care of the University Health Board.

8. RISK MANAGEMENT PRINCIPLES

Hazards associated with waterborne risks are managed in accordance with the following principle:



Where risks prove difficult to control, they will be added to the Health Board risk register in accordance with board-wide procedures.

The Health Board recognises the use of competent persons in all aspects of the risk management process. All staff and external contractors/consultants who are allocated with responsibilities and duties will be appropriately competent and carry out their duties in a safe and effective manner. The Water Safety Group will advise on expected levels of competence and verification thereof as appropriate.

9. RISK ASSESSMENT

9.1. Assessing the Risks from Legionella

The risks from legionella shall be formally assessed in accordance with the requirements of the HSE's approved code of practice (ACOP L8). Risk assessments shall be undertaken to the standards outlined in BS8580:2010 and the Legionella Control Association's service standard for legionella risk assessment.

The Estates AP (Water) shall maintain a detailed specification for legionella risk assessments and reviews and shall be responsible for the arranging and execution of legionella risk assessments on behalf of the statutory duty holder, including the selection of suitable competent persons to assist.

Risk assessments shall be formally reviewed to ensure they remains up to date no less often than every 2 years or whenever there is reason to suspect that they are no longer valid, resulting from:

- Changes to the water system or its use;
- Changes to the use of the building in which the water system is installed;
- The availability of new information about risks or control measures;
- The results of checks indicating that control measures and no longer effective;
- A case of legionnaires' disease or legionellosis is associated with the system.

9.2. Assessing the Risks from Pseudomonas

The risks from pseudomonas shall be formally assessed in accordance with the requirements of HTM 04-01 addendum '*Pseudomonas aeruginosa* – advice for augmented care units'. Risk assessments shall identify potential microbiological hazards caused by p.*aeruginosa* and other opportunistic pathogens and the hazardous events and risks that may arise during storage, delivery and use of water in augmented care settings. They should identify actions to minimise the risks and ensure that appropriate sampling, monitoring and clinical surveillance arrangements are in place.

Risk assessments should be undertaken by a representative or appointee of the IPC team on behalf of the IPC.

Risk assessments for *Pseudomonas aeruginosa* shall be formally reviewed to ensure they remain up to date no less often than every 2 years, or whenever there is reason to suspect that they are no longer valid, including:

- When results of surveillance identify failure of the control measures; or
- When a case or outbreak is associated with the system or location.

9.3. Assessing the Risks from Scalding

The risk from scalding from hot water supplies shall be assessed in accordance with HSE guidelines in all areas of the estate, including wards, resident's rooms and areas to which patients, residents and visitors have access. The assessment shall consider the susceptibility of those exposed to hot water including:

- Children;
- Older persons;
- Persons with reduced mental capacity;
- Persons with reduced mobility;
- Persons with a sensory impairment;
- Persons who cannot react appropriately or quickly enough to avoid injury.

Risk assessments for scalding shall be formally reviewed under the following circumstances:

- When there are changes to the use of the building in which the water system is installed;
- The availability of new information about scalding risks or control measures;
- A scalding incident has occurred.

10. DESIGN & CONSTRUCTION OF WATER SYSTEMS

The design and construction of water systems on University Health Board property is the responsibility of the Estates Capital Team who maintains engineering technical specifications which contain the following:

- Principle design criteria for water systems;
- Approved water system equipment and materials;
- Standards for installation and commissioning.

The Capital Team ensures that water systems and buildings in which water systems are installed are able to maintain safe water throughout the whole life of the system, with future development taken into consideration where practicable.

Water systems are designed, installed and commissioned in accordance with the requirements of current legislation and guidance as determined in the appropriate HTM as a minimum, thus enabling water systems to perform and be operated and maintained in accordance with HTM 04-01, ACOP L8 and HSG 274.

Maintaining appropriate ongoing controls in water systems post-handover is essential and building designs take into account the need for control measures to be maintained at all times, including seasonal, daily and diurnal fluctuations in occupancy of the building and use of water.

10.1. Major Capital Projects:

All new construction projects generally exceeding £5M in value, including all design and construction activity are undertaken under framework agreements with approved specialist design and construction companies, and often includes sub-contracting of installation and commissioning of water systems.

10.2. Discretionary Projects:

Specific mechanical & electrical projects and local property refurbishment projects generally up to £5M in value are often designed in-house, however all installation and commissioning works are delivered by approved contractors following competitive tender.

10.3. Design Risk Assessment:

All water system designs are subjected to a design risk assessment before construction commences where a schematic drawing of the water system and performance criteria (volume, flow, temperatures and other relevant controls) are reviewed and assessed by appointed Capital and Operational Authorised Persons (Water) and/or the Authorising Engineer (Water), and a representative of IPC.

10.4. Construction Risk Assessment

During construction, the Operational Authorised Person (Water) and/or Authorising Engineer (Water) are given access to the construction plans to enable a review of the operability and maintainability of water system assets.

10.5. Commissioning

Performance of the water system in line with design criteria must be proved and witnessed by or on behalf of the Authorised Person (Water) and/or Authorising Engineer (Water) during the commissioning process and before the project is handed over. Records of commissioning are issued as part of the Health & Safety Manual or Operation & Maintenance Manual.

The above procedures must be followed or otherwise satisfied where works of the same nature are carried out by or on behalf of Cardiff University on University Health Board property.

11. CONTROLLING THE RISKS FROM LEGIONELLA

Due to the source of legionella being the incoming water supply it is essential to prevent growth within the water system. The principal control measure for maintaining low levels of legionella bacteria in hot and cold domestic water systems is temperature, with the principle aim of avoiding water temperatures between 20°C and 45°C where the risk of legionella proliferation is at its greatest. The temperature controls that are employed are as follows:

- Cold water shall be stored and distributed to all services at no greater than 20°C;
- Cold water temperature shall not increase more than 2°C above that of the supply to the building;
- Hot water, where stored in vessels greater than 15 litres, shall be no less than 60°C;
- Hot water stored in vessels up to 15 litres shall be between 50°C and 60°C.
- Hot water shall be distributed to all services in non-healthcare premises at no less than 50°C;
- Hot water shall be distributed to all services in healthcare premises at no less than 55°C;
- Where hot water is circulated, the water returning to the source heater shall be no less than 50°C.

In addition to the above mentioned control measures, water systems will be designed, installed, used and maintained to avoid the deterioration of water quality, including:

i. Avoiding the use of materials that would harbour or provide nutrients for bacteria;
ii. Maintain systems in a clean and sound condition;
iii. Clear labelling of pipework;
iv. Avoiding over design, storage and stagnation;
v. Avoiding the creation of aerosols and breathable water droplets.

Systems shall be designed to suit the needs of the users, and allow for reasonable fluctuations in consumption due to occupation of the building. Where short term changes increase the risk of stagnation, flushing shall be undertaken. Where long term changes increase the risk of flushing, consideration shall be given to temporary or permanent draining and removal of the affected services.

Controls measures shall be applied to systems and activity associated with the identified risks (see section 8). Controls shall be monitored and tested to ensure they are effective and records kept. Where controls proved to be ineffective, the risk assessment(s) shall be reviewed.

Where temperature controls are difficult to maintain, secondary treatment utilising chlorine dioxide shall be employed. The application of chlorine dioxide shall be stable and consistent using an automated system that doses in accordance with the flow rate into the treated system. Levels of chlorine dioxide shall be maintained between 0.1 mg/litre (0.1ppm) and 0.5 mg/litre (0.5ppm). Chlorine dioxide systems shall be maintained and serviced regularly in accordance with manufacturer's instructions and include inspection for electrode wear and scale formation.

Treatment with chlorine dioxide shall always be supplementary to temperature and not as a replacement, therefore both control regimes shall be maintained.

Note, Chlorite and chlorate, the by-products of chlorine dioxide, are deleterious to neonates and renal dialysis patients, therefore water supplies to these areas must not be treated in this way. Where temperature controls are difficult to maintain, secondary treatment utilising chlorine dioxide shall be employed, with concentrations of total oxidant throughout the system of between 0.1mg/l and 0.5mg/l. Adequate control of the dosing system shall be maintained to ensure that the upper limit is not exceeded.

Where patients are at risk from known legionella problems, showers and outlets that may cause an infection shall be fitted with in-line point-of-use filters with an aperture of no greater than 0.2µm on

a temporary basis and until the contamination has been successfully removed. These filters shall be WRAS approved, CE marked and be guaranteed by the supplier to remove legionella.

12. CONTROLLING THE RISKS FROM PSEUDOMONAS

Due to uncertainty surrounding the source of *Pseudomonas aeruginosa*, controls for the prevention of growth of *Pseudomonas aeruginosa* shall be implemented both before and after water outlets.

Many of the controls in place for legionella will assist with the control of *Pseudomonas aeruginosa* within water systems, although there shall be a greater focus on the design and selection of water system outlets and fittings, and general hygiene arrangements and procedures to control external impacts.

Guidance on the selection and installation of wash hand basins and other sanitary assemblies with regards to improving the control of *Pseudomonas aeruginosa* is given in the addendum to HTM 04-01 and has been adopted as a standard.

In addition, the University Health Board recognise the importance of providing and maintaining a clean and appropriate environment, and the benefits to avoiding the spread of infection provided by good cleaning procedures.

Controls measures shall be applied to systems and activity associated with the identified risks (see section 8). Controls shall be monitored and tested to ensure they are effective and records kept. Where controls proved to be ineffective, the risk assessment(s) shall be reviewed.

Where patients are at risk from known contamination of the water system, outlets that may cause an infection shall be fitted with in-line point-of-use filters with an aperture of no greater than 0.2µm on a temporary basis and until the contamination has been successfully removed. These filters shall be WRAS approved, CE marked and be guaranteed by the supplier to remove p. *aeruginosa.*

13. CONTROLLING THE RISKS FROM OTHER PATHOGENS

In recent times, healthcare acquired infections have been linked to waterborne pathogens including *Stenotrophomonas maltophilia*, *Aeromonas spp*., *Acinetobacter spp*., *Enterobacter spp*. and non-tuberculosis mycobacterium. It is widely accepted that the measures used to control legionella and pseudomonas *aeruginosa* in water systems also have relevance to other opportunistic pathogens, and therefore the Health Board considers these measures to be sufficient.

14. CONTROLLING THE RISKS FROM SCALDING

As determined in this WSG, the control of legionella in hot water is by raising water temperatures to ensure that the temperature of water at the outlets is at least 50^{o}C in non-healthcare environments and 55^{o}C in healthcare environments. The risks from scalding will be formally assessed and reviewed on a regular basis risk assessments to determine if action is required to protect staff, patients and visitors who may be at risk of scalding.

The control of scalding where required shall be by means of type 3 thermostatic mixing valves (TMV) that comply with the requirements of Model Engineering Specification MES D08 'thermostatic mixing Valves (healthcare premises)', and are WRAS approved. TMVs shall be installed within 2m of the outlet, shall supply no more than 2 outlets and fitted centrally where this is the case. Where possible, thermostatically controlled taps shall be installed. In all cases, TMVs and associated hot and cold supply pipework must be accessible for regular testing and maintenance.

15. PROVISION OF SAFE DRINKING WATER

Drinking water outlets shall, where practicable, be supplied directly from mains water supplies without storage. Where this is not the case, drinking water outlets shall be tested regularly to ensure water remains fit for human consumption.

Drinking from cold water that is subject to continual dosing with silver ions should be avoided.

Where stand-alone water coolers, vending machines and ice makers are required, they shall be selected, installed and maintained by, or on behalf of the Estates Department.

The filtering of water where necessary shall be undertaken using appropriately selected filters and shall be maintained and/or replaced in accordance with manufacturer's guidance and local conditions to avoid the effects of failure.

16. WATER USED IN THE PREPARATION OF FOOD & DRINK

The use of water in the preparation of food and drink to be sold and consumed on Health Board premises shall be in accordance with current food safety regulations. This WSG limits its responsibilities to the provision of a continuous supply of wholesome water that satisfies these obligations.

17. WATER QUALITY – SAMPLING & ANALYSIS

Sampling and analysis of water shall be undertaken in accordance with sample plans and escalation procedures by, or on behalf of the Estates department by appropriately competent persons following approved procedures. All samples shall be analysed at a UKAS accredited laboratories – the use of on-site testing and dip-slides is not permitted.

Detailed sampling procedures and methodologies for planned and reactive sampling, including transportation and storage requirements shall be controlled by the AP (Water) and shall be adhered to by any external service providers unless otherwise authorised by the AP (Water) or AE (Water) in his/her absence. Samples shall always be delivered to the laboratory within 24 hours and processing commenced immediately.

17.1. Reoccupation of Premises, Construction & System Modifications

Sampling and analysis of water prior to reoccupation where premises have been mothballed or otherwise unoccupied, or following construction and modifications to water systems, shall be carried out as determined by the project plan and in accordance with BS8554:2015, and shall include the following parameters as necessary:

Parameter	Target
TVC (total viable counts) measured at 22 °C	To establish a baseline (review if >300 cfu/ml)
TVC (total viable counts) measured at 37 °C	To establish a baseline (review if >300 cfu/ml)
Coliform bacteria	Nil in 100ml
Enterococci	Nil in 100ml
E. coli	Nil in 100ml
Legionella	Not detected in 1000ml (@ LOD 100 cfu/l)
Pseudomonas aeruginosa	0 cfu/

Where systems have been disinfected, samples of the water shall be analysed for disinfection residues in addition to the above microbiological parameters.

Positive sample results in excess of the specified parameters given above shall be dealt with in accordance with the relevant escalation procedures.

17.2. General Surveillance:

Sample plans for routine surveillance shall be produced by IPC and issued to Estates under approval of the WSG. Escalation procedures for dealing with positive results shall be produced and managed by the Estates' AP (Water) and approved by IPC.

Sampling and analysis of water for surveillance of systems and verification of control measures is not normally considered necessary, except in augmented care areas or as otherwise determined by IPC. Surveillance sampling may also be undertaken to verify the effectiveness of control measures, or where controls regularly or consistently fail to meet the required parameters.

Surveillance sampling for TVCs (total viable count) as an indicator of water quality is not considered necessary.

Surveillance sampling for legionella shall be post flush samples without disinfection of the outlet (also known as combined samples) in order to indicate both local and systemic contamination. Samples shall be collected, stored and transported to the UKAS accredited laboratory in accordance with BS7592:2008. The temperature of the water and the residual level of any supplementary biocide shall also be recorded at the time of sampling to assist with understanding the impact of any positive counts.

Sample results that exceed the targets in the above table shall be dealt with in accordance with the relevant escalation procedures.

Surveillance sampling for pseudomonas *aeruginosa* shall be pre-flush sampling without disinfection of the outlet, and shall be carried out after a period of no use of that outlet of at least 2 hours – ideally overnight where practicable. In addition, periodic sampling of taps in close proximity to others should be staggered to avoid “batching” of results. Positive sample results (>1cfu/l) shall be reacted to in accordance with the relevant escalation procedures.

17.3. Investigative Sampling

To determine the extent of a problem identified during sampling, escalation procedures shall be used under the supervision of the AP (Water). Where required, the AP (Water) shall produce an investigation sample plan which ensures samples are taken from critical points throughout the system.

Where investigations for legionella are undertaken, pre-flush and post-flush (with disinfection of the outlet) samples shall be used to determine if the problem is systemic or local to outlets where relevant.

Where investigations for pseudomonas *aeruginosa* are undertaken, pre-flush and post-flush samples shall be used to determine if the problem is systemic or local to outlets where relevant. Disinfecting or cleaning of taps and outlets shall not be undertaken before collecting pre- or post-flush samples.

18. AVOIDANCE OF STAGNATION

Avoiding stagnation in water systems is critical to avoid water quality deterioration. As detailed in Section 7, Departmental Roles & Responsibilities, premises occupiers are responsible for identifying areas of the water system, including individual or groups of outlets, that are not being used on a regular basis (i.e. at least every day) and carrying out flushing to replenish water within the pipework and fittings with fresh water from supply.

All areas shall have in place appointed persons responsible for this aspect and shall maintain a comprehensive set of records locally that are available for inspection at any time.

A representative of the Estates team will carry out period audits of flushing across the Estate and provide reports to the WSG at each meeting.

Appendix E contains the guidance note and standard flushing record that shall be maintained in each area file.

19. COMPETENCE

For the purpose of water safety, the WSG defines a competent person as someone with adequate knowledge, experience and instruction combined with the personal attributes required to carry out a task in a correct and safe manner.

All members of the WSG and persons allocated with departmental responsibility shall be suitably competent and able to carry out their allocated duties to the standard required, safely and on schedule. Adequately competent deputies shall be available at all times to provide cover during periods of absence that may affect task or duty schedules.

The appointed Responsible Person, Authorised Person & Appointed Deputies shall have undertaken formal training in the following areas as a minimum specific to ACOP L8, HTM 04-01 and HSG 274 parts 2 and 3:

- Awareness of legionella, pseudomonas aeruginosa and other waterborne pathogens;
- Management of the risk for appointed responsible persons;

Appointed Competent Persons and tradespersons (including contractors and directly employed personnel) whose roles involve working on or around water systems, including those undertaking tasks associated with the scheme of control, shall undergo the following formal training as appropriate:

- Awareness of legionella, pseudomonas aeruginosa and other waterborne pathogens;
- Task specific training as appropriate to the tasks undertaken including awareness of methodologies and standards to be applied;
- Awareness of the requirements of the Water Supply (Water Fittings) Regulations 1999

Those involved in the design, installation and commissioning of all water service systems, including minor and major capital works shall be fully aware of the requirements under ACOP L8 to ensure water systems comply with the requirement of ACOP L8, the Water Supply (Water Fittings) Regulations 1999 and HTM 04-01, and are safe and easy to operate and maintain, and that appropriate information is supplied.

All hotel services and cleaning staff shall be aware of the requirements and procedures for avoidance of cross-contamination and the control of pseudomonas *aeruginosa* when cleaning around water services.

All staff whose duties include the identification and flushing of little used outlets shall be given suitable instruction on the reasons for and how to carry out the required duty.

The competence of persons shall be assessed from time to time in accordance with their allocated duties, and where necessary additional training and instruction provided. Spot checks and audits shall be undertaken from time to time to confirm these requirements have been fulfilled.

The competence of external suppliers and contractors shall be a mandatory requirement of tender procedures and evidenced before any contracts are let. Contractors employed to undertake tasks associated with the implementation, monitoring, testing and inspection of control measures associated with the control of legionella shall be members of the Legionella Control Association. Whilst this alone does not guarantee competence, it does ensure that service providers have a system for maintaining and assessing the competence of their own staff - this shall be verified by the AP (Water) before engagement.

20. RECORD KEEPING

Records of all relevant activity, from appointments and risk assessments, to flushing records and corrective actions shall be maintained by those appointed in accordance with departmental procedures. Records shall show the date and time of any task or duty undertaken and the name and/or signature of the person(s) carrying out the task, as applicable.

Records must be clear and concise, comprehensive and auditable and must be backed-up to ensure continuity in the event of loss for any reason.

Electronic copies of all records are generally preferred due to the robustness of the Health Board's IT system.

This WSP and associated appendices shall be held in the Capital Estates & Facilities Intranet Site and made available to all members of the Water Safety Group as a minimum.

Each building shall have the following records associated with it:

- Documented appointments for water safety management
- Legionella risk assessment;
- Pseudomonas aeruginosa risk assessment (if augmented care);
- Scalding risk assessment;
- Schematic drawing of the water system or up-to-date layout drawings
- Results of checks of control measures
- Flushing records
- Non-conformance reports and corrective action records
- Staff training records

21. INCIDENT MANAGEMENT

Any incidents associated with water safety and hygiene shall be managed by the DIPC in accordance with Health Board's Incident Plans. Members from the WSG shall provide support and assistance where required, including providing emergency services to prevent harm or ill health to patients, staff and visitors. The Estates AP (Water) or a deputy shall provide support to the incident management team by coordinating any necessary resources to undertake engineering works required, including assistance with investigation.

22. AUDIT & REVIEW

The WSG shall be collectively responsible for auditing all processes being carried for the control of water safety in accordance with this WSP.

Appointed departmental representatives on this WSG shall carry out a rolling programme of checks and audits of the processes and procedures being carried out within their department (either direct or indirect using UHB's externally appointed specialist independent advisor) to assess compliance, and report to the WSG at each quarterly meeting.

Details of these checks and audits are specified in each departmental written procedure.

Where checks or audits identify non-compliances, the departmental representative shall ensure that appropriate follow up action is taken in accordance with the risk posed, and records of all corrective action retained.

This WSP shall be reviewed on an annual basis by the Water Safety Group.

23. LIST OF APPENDICES & ASSOCIATED DOCUMENTS

		Issue Date:
A	Water Safety Group Appointments	7/12/16
B	Water Systems by Premises	7/12/16
C	Premises Occupation & Management List	7/12/16
D	Augmented Care Areas List	7/12/16
E	Identifying & Flushing Little Used Outlets	6/11/17