

Document Control

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Contents

	Page	
1.0	Introduction, Purpose, Scope and Definitions	1
2.0	Responsibilities, Appointments and Assurance	
3.0	Water Safety Group	
4.0	Training	
5.0	Water Safety Management (Conditioning) Audits	
6.0	Water Safety Risk Assessment	
7.0	Water Safety Action Plan	
8.0	System Operation and Monitoring	
9.0	System Planned Preventative Maintenance Requirements	
10.0	Planned Preventative Maintenance Review Procedures	
11.0	Bacterial Sampling	
12.0	Design Standards and Preferred Solutions	
13.0	Protection of Staff	
14.0	Closure and Occupation of New Premises	
15.0	Action in the event of a suspected case or outbreak	
16.0	Temperature Monitoring and Checks	
17.0	Record Retention	
18.0	Appendices - N.B. The following appendices are stored in the Hard FM Shared Drive (K)	
	Audit Documentation (Figure 2)	
	A1 Tank Cleaning Procedure	
	A2 Elevated Cold Water Temperature Procedure	
	A3 DHW Additional Actions	
	A4 DHW Failure Procedure	
	A5 Cleaning Water Systems within Buildings	
	A6 Safe Purging of Stagnant Water	
	A7 Maintenance Checks on other Water Systems	
	A8 Basic Checklist for New Water System Design	
	A9 Monitoring Forms	
	A10 Action Plans	

1.0 Introduction, Purpose, Scope and Definitions

The purpose of this document is to define the procedures to be followed to prevent, minimise and control the risk of harm associated with Legionella, *Pseudomonas Aeruginosa* and other water borne micro-organisms.

The risk to patients, visitors and staff will be reduced to the lowest level practicable by designing, operating, maintaining plant and equipment in accordance with the Scottish Health Technical Memorandum 04-01 (sections A to G) and the Health and Safety Executive Approved Code of Practice (L8) The Control of Legionella Bacteria in Water Systems.

This Procedure is also aligned with the NHS Lothian Water Safety (Corporate) Policy.

Other documents that are aligned with this procedure include:

- Water Safety Plans (WSP)/Scheme of Controls
- Water Safety Document Control System 1 (Management) Responsible Person (RP) Level
 - Audit Reports
 - Risk Assessments
 - Appointments
 - Training
 - WSG Terms of Reference
 - WSG Minutes
 - Assets
 - Water Safety Action Plan
 - Water Safety Procedures/Scheme and Document Guidance
- Water Safety Document Control System 2 (Implementation) Authorised Person (AP) Level
 - Standards of Design and Schematics
 - Planned Preventative Maintenance and Repair Schedules
 - Water Sampling
 - Water Monitoring
 - Trends and KPI's
 - Log Sheets and Records
 - Health and Safety Information

The scope of this procedure covers:

- All occupied buildings with a water supply under the control of NHS Lothian
- All unoccupied buildings with a water supply under the control of NHS Lothian
- Temporary buildings with a water supply under the control of NHS Lothian
- Excludes water quality control measures associated with Hospital Sterilisation and Decontamination Units, Endoscopy Decontamination Units, Dental Decontamination Units and Mobile Screening Units.

Definitions:

- **ACOP L8:** Health and Safety Executive's Code of Practice on Legionnaire's Disease
- **CAFM:** Computer Aided Facilities Management System
- **Contractors** –external contractors approved to work on water systems
- **E Coli** – Escherichia Coli is a bacterial infection that can cause severe illness from inadequately treated drinking water supplies
- **IPCT:** Infection, Prevention and Control Team
- ***Pseudomonas Aeruginosa*** is a Gram negative organism most commonly found in soil and water. It can be isolated from any moist environment. It is often termed an '**opportunistic pathogen**'. Water within systems can periodically be contaminated with these organisms. Although mains supplied water is treated and disinfected, it contains at the point of use, only residual (relatively low) levels of disinfectant chemicals (e.g. chlorine).
Note: An **opportunistic pathogen** is one which normally only causes an infection in a person with a weakened immune system.
- **Legionnaires' Disease** is a potentially fatal form of pneumonia which can affect anybody but which principally affects those who are susceptible because of age, life-style, illness, or immuno-suppression. It is caused by the bacterium Legionella Pneumophila and related bacteria.
- **Legionella** can survive under a wide variety of environmental conditions and have been found in water at temperatures between 6^o C and 60^o C. Water temperatures in the range 20°C to 45°C seem to favour growth. The organisms do not appear to multiply below 20°C and will not survive above 60°C [1]. Water is therefore not sterile and has a (highly variable) background level of micro-organisms, measured in terms of the **Total Viable Count (TVC)**. Levels of TVC organisms in water samples give an indication of the effectiveness of residual disinfection and consequently the likelihood of finding potentially pathogenic micro-organisms.
- **SCART:** Statutory Compliance Audit and Reporting Tool used to review compliance against a specific set of standards – of which Water Safety is one of the modules
- **SHTM:** Scottish Health Technical Memorandum (04-01 parts A to G)
- **Total Viable Count:** method of providing a quantitative estimate of the concentration of micro-organisms
- **Waterborne pathogen:** microorganism with a water related reservoir and habitat capable of causing human disease that may also be transmitted via water and acquired through ingestion, inhalation or direct skin contact
- **Water Safety Group:** multidisciplinary group formed to undertake the commissioning, development and ongoing management of the site specific Water Safety Plans (WSP). It also contributes to the Problem Assessment Group and the Incident Management Team in agreeing remedial actions required when water systems or outlets are found to be contaminated and the risk of acquiring a Healthcare Associated Infection by susceptible patients if increased.
- **Water Safety Management Chain :** persons defined in the Water Safety Governance Diagram
- **Water Safety Plans/Scheme of Controls:** a site or building specific plan detailing the hazards and actions to be taken to minimise the risks associated with water systems

2.0 Responsibilities, Appointments and Assurance

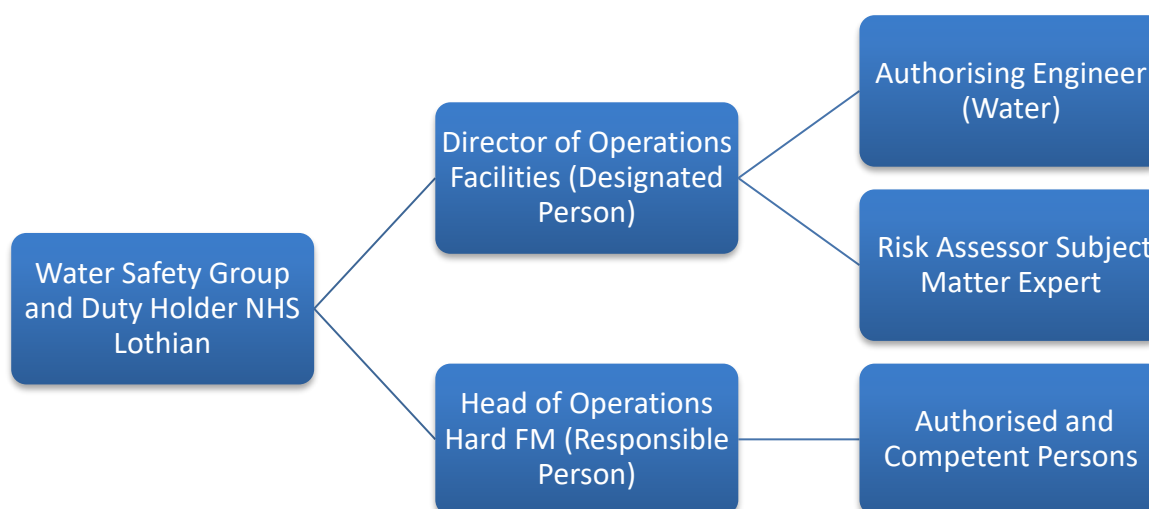
2.1 Facilities are committed to the appointment of the necessary personnel to deliver this Procedure.

For Facilities this is:

- Designated Person (Water)- Director of Operations Facilities
- Responsible Person (Water)- Head of Operations Hard FM
- Authorising Engineer (AE) – Independent Professional Adviser
- Risk Assessor/Subject Matter Expert
- Authorised Person (AP) – Hard FM NHS Lothian
- Competent Person (CP) - Hard FM NHS Lothian
- Area Managers Hard FM and Soft FM

All of these appointments require to be made in writing and the appropriate approved competency training completed and evidenced. All files are stored electronically on the Facilities Shared Network Drive.

Full role descriptions are contained within the NHS Lothian Water Safety Policy



2.2 Assurance

Assurance with regards to the implementation of this procedure and compliance reporting will be achieved through:

- Each quarter Facilities Hard FM Area Managers will provide information on compliance with this procedure, and this is incorporated into the required quarterly health and safety reports for both the Facilities Overarching and the NHS Lothian Health and Safety Committees.*
- For effective governance this report will also be reviewed quarterly at the Facilities Heads of Service Meeting
- A level of assurance will be evaluated following audit activity including the AE(W) audits
- There is a self assessment checklist in the *Appendices Section* to determine levels of compliance, this will be completed for each site by each Hard FM Area Manager with their associated AP's and CP's
- SCART – National Compliance Assessment Checklist (Water Safety Module) will also be completed to further determine compliance levels and any further actions required,

Reporting Routes – Hard FM Area assurance to Heads of Service and Facilities Overarching H&S Committee



2.3 Soft FM Domestic Services

Domestic Services are responsible for flushing and cleaning tasks as specified in NHS Scotland's National Cleaning Services Specification and Health Protection Scotland Guidance.

The Domestic Services staff follow ***the Facilities Domestic Services Flushing Standard Operating Procedure*** at each site which details how to carry out the cleaning and flushing tasks required.

This does not include flushing (first thing in the morning) regimes within Augmented Care Areas.

The exception to this is where the water supply is in an area or building no longer in use/temporarily out of use or under the control of a Third Party Duty Holder (e.g. PFI Provider)

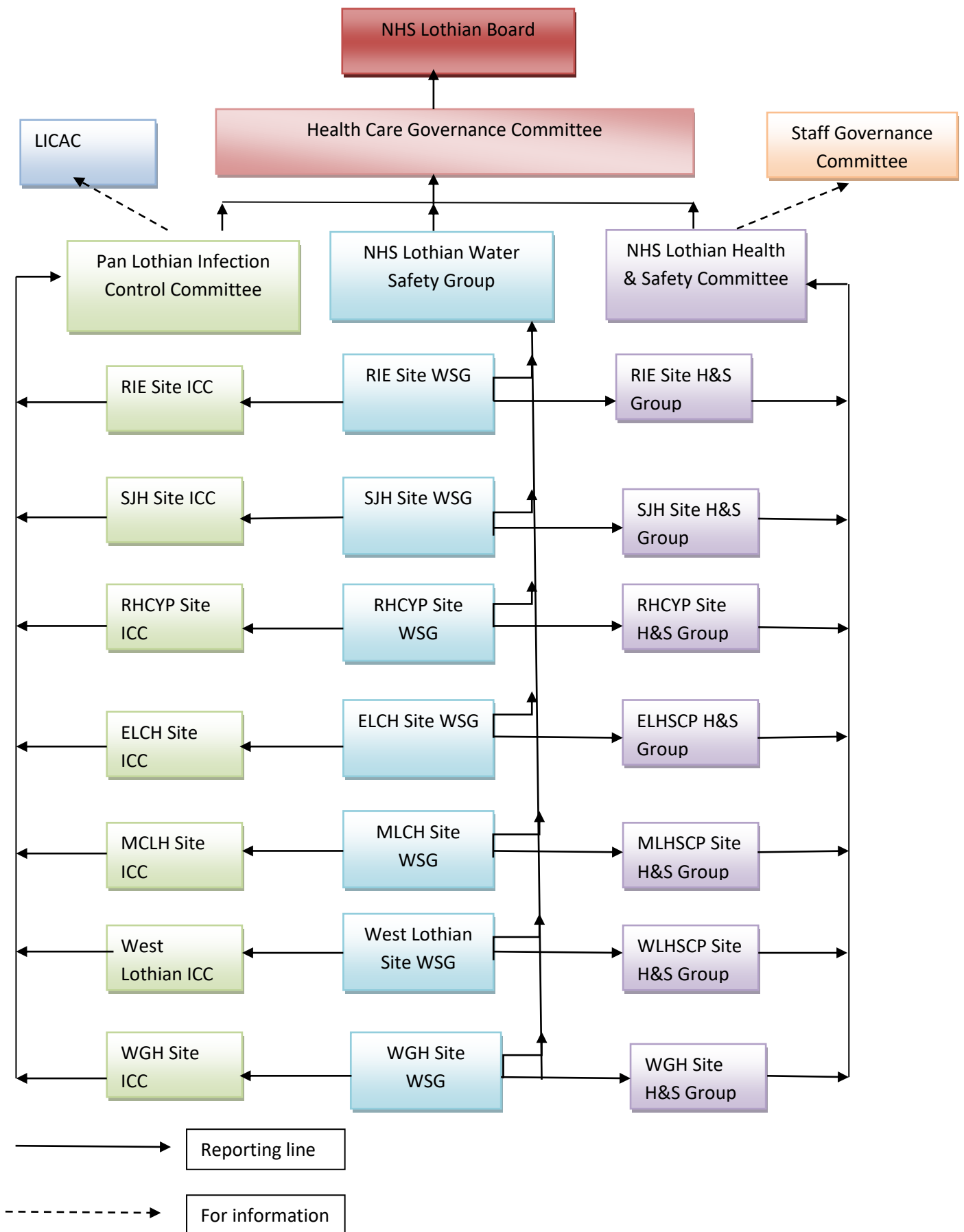
2.4 Other Operational Functions

Hard FM Facilities will also manage and control the work of trades/craft persons, installers and contractors.

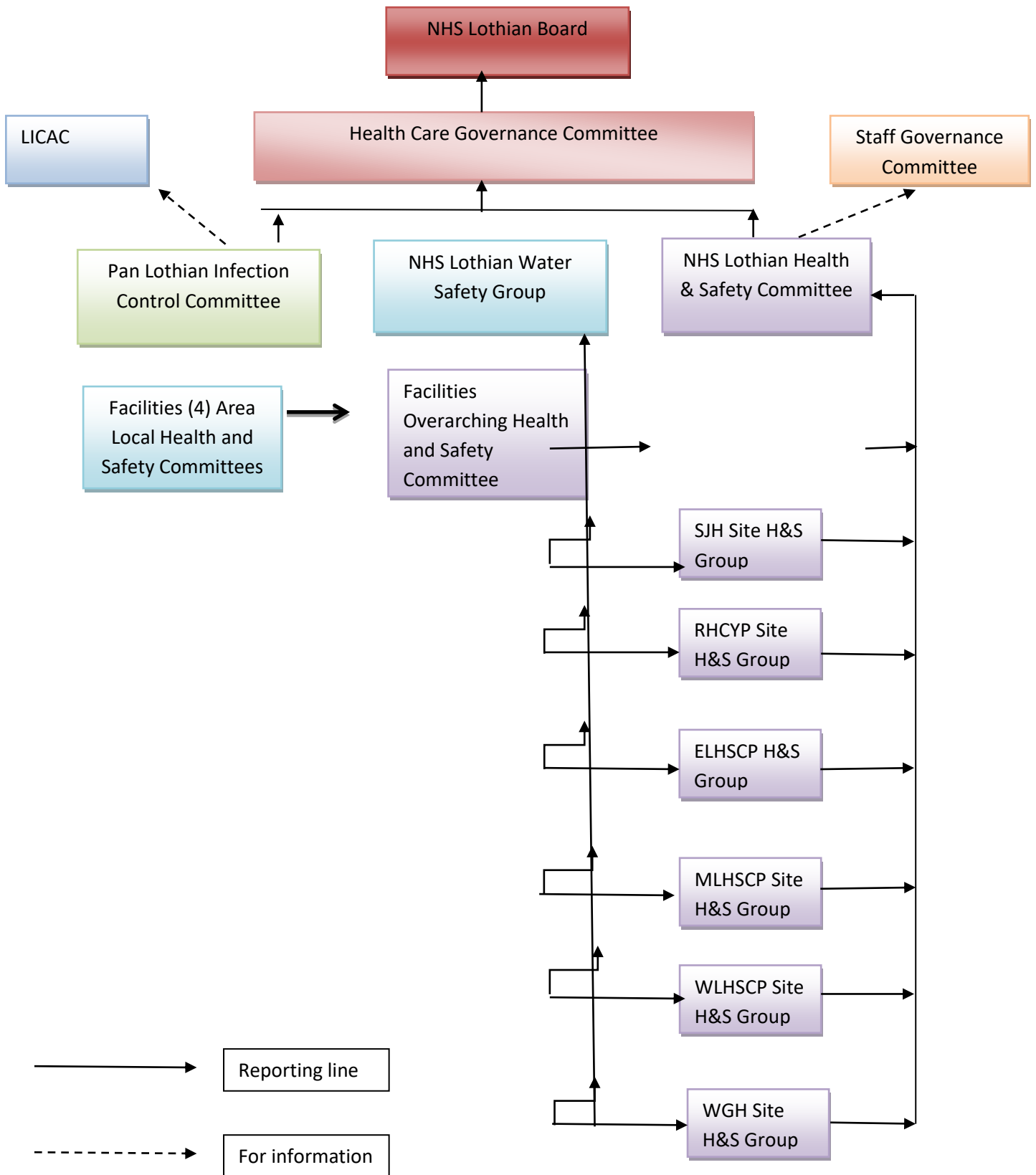
The following table will be completed at each site to identify Facilities roles and responsibilities.

Water Safety Role	Name	Appointment by	Job Title	Contact Details
Duty Holder			Chief Executive	
Designated Person (Water)		In writing by the Chief Executive	Director of Operations Facilities	
Responsible Person (Water)		In writing by the Director of Operations Facilities	Head of Operations Hard FM	
Authorising Engineer (Water)		In writing by the Director of Operations Facilities		
Risk Assessor/Subject Matter Expert		In writing by the Director of Operations Facilities		
Appointed Person (Water) AP		In writing by the Head of Operations Hard FM		
Competent Person (Water) CP		In writing by the Appointed Person (Water)		
External Approved Contractors		In writing by the Appointed Person (Water)		
Infection Prevention and Control – Local Contact				
Consultant Microbiologist – Local Contact				
Site Director				

NHS Lothian Water Safety Group Governance



FACILITIES REPORTING STRUCTURE



2.5 Facilities Representation at Health and Safety and Water Safety Groups

Facilities Hard and Soft FM Area Managers (or designates) and/or Authorised Person (Water) will wherever possible attend local site groups.

Where this is not possible a condition report will be forwarded to the chair ahead of the meeting date.

3.0 Water Safety Group

Facilities will ensure Senior Management Team attendance at the Water Safety Group and ensure the group is informed of:

- Water safety management control processes (flushing, cleaning, dosing, maintenance and repair) in premises
- Any positive sampling and the actions required or that have been taken
- Assurance levels for water safety Pan Lothian
- Any issues requiring further escalation

4.0 Training

The Facilities Directorate will ensure all relevant Facilities staff receive the required level of accredited competency training to ensure they fulfil their responsibilities under the SHTM, Policy and this Procedure.

This is likely to be:

- Responsible Person – minimum City & Guilds (or equivalent) RP/AP training course
- Appointed Person - minimum City & Guilds (or equivalent) RP/AP training course
- Competent Person - minimum City & Guilds (or equivalent) CP training course
- Domestic Services Staff – water safety awareness training

All training will be subject to a formal refresher at least once every three years.

Other water and/or safety related training (e.g. COSHH) will also be provided to other staff carrying out specific tasks; this will either be formal/accredited or in house / tool box talk.

5.0 Water Safety Risk Management

NHS Lothian will implement a programme of external monitoring audits (carried out by Risk Assessor/Subject Matter Expert) for all water systems under their direct operational control. The requirement for these external monitoring audits forms part of the Water Safety Plans (WSPs) for

each building, and the objective of each audit is to confirm the appropriateness and efficacy of the currently applied Water Safety Control Scheme.

5.1 Frequency

Within the NHS Lothian estate, each building has been assigned a risk rated category, ranging from Category 1 (highest risk) to Category 4 (lowest risk). The ratings are derived from the susceptibility to infection of occupants and the degree of exposure, and are principally based on the guidance given in Table 2 of *SHFN 30 Part B: HAI-SCRIBE Implementation Strategy*, together with the typical occupancy levels a building may experience. The WSP and System Condition Audits for each Category 1 and 2 premises will be performed at a six-monthly frequency, and the Category 3 and 4 premises annually.

5.2 Process

The audits will comprise the following processes;

- An inspection survey of all main plant item components comprising the water systems to ascertain their physical and hygienic condition.
- A review of the operational procedures and processes applied to the water systems.
- A review of any alterations to either the water systems or the building's operational or occupancy patterns.
- From the above, the Engineering Risk Assessment will be reviewed to confirm it's validity.
- A review and update of the WSP Remedial Action Plan.
- A review of the WSP documentation to verify information is current.
- Retrieval of samples for laboratory analysis to confirm the bacteriological safety of the water in the systems and to assess the efficacy of the currently applied control measures and appropriateness of existing operational practices.

5.3 Reporting Instructions

- Where an audit reveals a condition, circumstance or unsatisfactory analysis result, the Appointed Person Water (APW) for the building will be immediately notified both verbally and in writing of the relevant finding. This notification will be accompanied by recommended remediation actions, and a programme agreed with the AP in respect of the implementation of the necessary remediation and subsequent reassessment or retesting.
- The Appointed Person Water (APW) will notify (without delay by telephone and email) the local Infection Prevention and Control Team, Consultant Microbiologist, Site Director and the

appropriate clinical lead. All will agree the appropriate course of action and proceed with the remedial action plan.

- This will then be recorded on Datix by Estates and reviewed until closure
- On completion of all analyses results and (where required) remediation works or change in practice, a formal record report will be produced for retention by the Estates Department.

5.4 Facilities Hard FM will have the responsibility to ensure:

- Areas, buildings and documentation are accessible to the Auditor
- Every assistance is provided to the Auditor as required
- Act without delay upon receipt of an 'Immediate Reportable Observation or Result' (IROR) Report. This will also be escalated to the Head of Estates and the Director of Facilities who will inform the Chair of the Water Safety Group (Duty holder). This will be formally recorded within the Facilities Departmental Computer Aided Facilities Management System (CAFM). A Datix Report will also be raised and reviewed.
- Audit findings are escalated to the Head of Estates – and further on throughout the Water Safety Management Chain
- Action plans are closed out post audit

5.5 PFI Sites and Operational Partners (Third Party Duty Holders)

Where Hard FM Facilities are not directly responsible for the management of water safety then formal assurance should be sought from the Third Party Duty Holder.

An assurance request checklist is included in the Appendices section and should be sent to the site contract manager for completion annually.

NHS Lothian's Authorising Engineer will review the Checklist as part of the annual audit and report to the Water Safety Group.

Ref: NHSL Water Safety Third Party Provider Checklist

6.0 Water Safety Risk Assessment

6.1 Hard FM Facilities Management will ensure:

- The completion of water safety and hygiene risk assessments in accordance with SHTM 04-01, L8, HSG 274 and BS8580 by the Independent Adviser/Risk Assessor in each building under NHS Lothian control
- The risk assessments are carried out by an Independent Legionella Control Association (LCA) Member and shall be 'Water Safety' and not just Legionella

- A suitable risk assessment is carried out wherever any water is present, stored and used in any way which may create a reasonably foreseeable risk of Legionella, *Pseudomonas Aeruginosa* and/or any other water related safety issues.
- The assessment will focus on water services microbial hazards and risks. Systems which are considered susceptible to colonisation by Legionellae, *Pseudomonas Aeruginosa* and other pathogens – and which incorporate the means for creating and disseminating water droplets are to be carefully assessed, evaluated and remedial actions taken as appropriate.
- The assessment will also take into consideration the asset register and associated plant on sites
- Risks should be assessed not just for routine operation but also for non routine circumstances such as breakdown, abnormal water sampling results and abnormal operation and commissioning.
- In accordance with BS8580 the risk assessment will include a formal document review
- Schematics are produced and/or revised as necessary
- Risk assessments are reviewed and audited bi-annually or annually if the risk levels dictates this or if there are any changes to the building, site, activities, new information/legislation water systems or occupants.
- Risk assessments will be subject to a review (without delay) if any cases of ill health is found to be associated with the water systems
- Remedial actions identified as part of the risk assessment process are implemented and/or closed out as required

6.2 The risk assessments will take account of:

- The potential for aerosol formation
- Water temperature
- Means of preventing, minimising and/or controlling the risk
- The potential risk to those who may inhale water droplets.

In a Healthcare setting the risk of harm from potential exposure is divided into three categories:

1. **High Risk:** such as speciality departments and augmented care areas such as the care and treatment of patients associated (for example) with:
 - Head/Neck Respiratory Cancers
 - Bone Marrow Transplant
 - Renal Dialysis
 - Leukaemia
 - Organ Transplant
 - Acquired Immune Deficiency Syndrome
 - Neonates

- Immunosuppressed and/or Neutropaenic Conditions
- Intensive or High Dependency Care Units

2. **Moderate Risk:** other healthcare premises, general wards or departments including outpatients
3. **Low Risk:** non healthcare premises such as Ambulance Stations and Office Blocks

6.3 An area risk matrix will be developed (in conjunction with Clinical Colleagues) to identify the risk areas and there associated categories – such as the table below

Group 1 (Low risk non patient areas)	Group 2 (Medium risk)	Group 3 (High risk)
Office areas/corridors outside of clinical areas	A&E clinical rooms	PHE Guidance definition of high risk (Neutropaenic areas). All such areas to be included
Plant rooms/service ducts	Radiology/MRI	Augmented care locations as defined in the NHS data dictionary
Primary care/community treatment rooms	General surgery recovery units	Day surgery rooms
Laboratories	General wards	All intensive care units
Pharmacy (general)	Admissions/discharge units	All operating suites
Sterile services departments	Echocardiography	All high dependency units
Main kitchens	Other departmental clinical areas	Renal ward / Dialysis & transplant units
Office areas/corridors outside of clinical areas	Out-patient department	Oncology
Plant rooms/service ducts	Endoscopy clinics	Cardiology / cardiac care unit
	A&E clinical rooms	Cardiac catheterisation suite
	Radiology/MRI	Pharmacy clean rooms
	General surgery recovery units	Haematology
		Nuclear Medicine
		High dependency unit
		Combined high dependency & ICU
		Combined coronary and ICU
		Post operative recovery unit
		Spinal injury
		Burns critical care unit

Additional Note:

Group 1: are areas where patients are not expected to be present. Taps can be of a simple domestic type (no mixing preferred) and a ‘caution hot water’ label should be present above the taps.

Group 2: are areas where patients are expected to be present or where processes require a higher degree of care. In these areas consideration should be given to the potential risk of scalding and

thermostatic mixing valves /sequential taps should be used.

In rooms in wards or clinical departments where patient access is restricted (DSR's, sluices or ward kitchens) no mixing is preferred.

Group 3: are areas where patients are expected to be more susceptible to harm from Pseudomonas, Legionella and other water borne issues. In these areas all outlets will be smooth bore – not sand case.

Wash hand basins that patients have access to will have thermostatic mixing valves/sequential taps fitted and maintained.

In areas where patient access is restricted (as detailed above in Group 2) no mixing is preferred.

6.4 Water systems that present a water hygiene risk in NHS Lothian include:

- Hot water systems and services – including storage systems, distribution systems, valve arrangements, thermostatic mixing valves and flexible hoses
- Hot and cold water systems and services (irrespective of size) where occupants are particularly susceptible and vulnerable – including storage and distribution systems, outlets (basins, sinks, bidets, w.c's) valve arrangements, thermostatic mixing valves and flexible hoses
- Humidifiers, which create a spray of droplets and in which the water is likely to exceed 20°C.
- Air conditioning systems including portable air conditioning units
- Spa baths and pools in which warm water is deliberately agitated and re-circulated
- Air handling units (scope will be defined by the detailed Legionella risk assessment)
- Fire fighting installations such as sprinkler systems, storage tanks and wet risers
- Dental watering systems
- Water (ornamental) features
- Renal Plant
- RO Plant (HSDU)
- Other clinical systems employing water
- Plant and systems containing water which is likely to exceed 20°C and which may release a spray or aerosol during operation or during maintenance

6.5 Risk identification, evaluation and control measures

Any assessment carried out should involve a detailed on-site survey of each system named above to ensure:

- Alignment with the required documentation detailing the engineering design factors, maintenance and operational procedures for the plant and services

- The production of as fitted drawings and schematics for all water systems which in themselves should show:
 - layout and arrangements of all calorifiers and pumps
 - layout and arrangement of all cisterns and humidifiers
 - identification of all other water systems which may present as a water hygiene hazard or a scalding risk
 - locations of dead legs and blind ends with lengths and diameters
 - valve location (DRV's, NRV's and TMV's)
 - shower locations
 - sentinel points
 - flexible hoses
- Identification of any works necessary for statutory and non statutory purposes – this will require:
 - tracing all water pipework, identifying assets and elements
 - measuring the time taken to achieve recommended temperatures at hot and cold water outlets
 - carrying out periodic reviews of stored water volumes and an assessment of total stored capacity in hours
 - measuring temperatures at all cisterns, calorifiers, pumps, humidifiers and other water systems which may present as a water safety hazard
 - identifying infrequently used outlets and associated pipework
 - carry out a quarterly check of shower hoses in relation to length (1.2 to 1.5 metres only) and the condition of the retaining clip
- The listing of all buildings in priority order of non compliance, potential risk and the significance of harm
- The elimination of risk (where practicable) by removing unused plant and equipment
- The development of (local building specific) written schemes for risk minimisation and control (action plans) – in order of priority – whilst considering risk, harm, cost and difficulty of remediation
- The development, implementation and review of a written strategic management action plan (Head of Estates) identifying risks, compliance, actions and resources
- Adequate records of all the above data will be retained within a proper documented and auditable control system

7.0 Water Safety Plans (WSP)

Each site will have a detailed water safety plan – this may be per site or per building.

The size and the content of the water safety plan will depend on the capacity and complexity of the building and the associated water system – but will contain (as a minimum) the following:

- Details of competent personnel
- Drawings and schematics
- Water safety risk assessments
- Temperature checks frequencies
- Flushing regimes
- Cleaning , maintenance and disinfection
- Dosing and sampling information and frequencies
- PPM scheduling
- Fault resolution
- Training
- Actions to be taken in the event of positive sampling
- Actions to be taken in the event of an outbreak

This plan will be owned and managed by the Hard FM Area Manager and information provided quarterly for the Facilities Overarching and the NHS Lothian H&S Committee.

Records (associated with all aspects of water safety management) must be stored appropriately and easily retrievable for the purposes of audit.

Levels of assurance will be evaluated following audit and sampling of the retained records.

8.0 System Operations and Monitoring

8.1 Maintenance and Monitoring Regimes

This shall be in accordance with industry best practice and in compliance with SHTM 04-01, L8 and BS8580.

All sampling and monitoring will have a clear audit trail and Facilities will ensure that all records:

- Comply with statutory and non statutory provisions
- Are representative of all services and systems
- Are visible and able to be evidenced/audited as required

8.2 Precautionary Measures (Preventing and Minimising the Risks)

These can and will include some of the following:

- Avoidance of water stagnation – hot and cold water systems
- Keeping the length of pipework carrying blended water 25°C-45°C to the minimum (never more than 1m)
- Avoidance of water temperatures and conditions that favour the proliferation of Legionella and other micro organisms

- Ensuring that the hot water from the Calorifier Hot Water Generator is at or above 60°C and that it does not fall below 55°C in the circulation pipework. At these temperatures, however, there is a risk of scalding and a separate scalding assessment should be carried out and fail safe thermostatically controlled mixing valves (TMV's) should be located as close to the outlet as possible. This will allow the water temperature to run lower – nominally around 43°C and reduce the risk of scalding.
- Removing all plant, taps, outlets and associated pipework which are not needed due to disuse or under use
- Reducing the length of dead legs of spurs from the main hot water tap circulation (maximum 5m)
- Minimisation of the release of water spray
- Carry out a quarterly check of shower hoses in relation to length (1.2 to 1.5 metres only) and the condition of the retaining clip
- Avoidance of the use of materials that harbour bacteria and other micro organisms, or provide nutrients for microbial growth
- Maintenance of the cleanliness of the system and the water contained within it
- Keeping storage cisterns clean and sealed from extraneous matter and insulating where necessary to maintain the temperatures below 20°C
- Reducing the amount of water stored (24 hours maximum)
- Use of water treatment techniques
- Actions to ensure the correct and safe operation and maintenance of the water system and associated plant
- Any scheme(s) implemented should specify measures to ensure that it remains effective and compliant; whilst identifying the appropriate measures to be taken when checks indicate any schemes are no longer effective.

8.3 Water Sampling

Microbiological Sampling must be carried out by suitably trained personnel, preferably accredited to ISO/IEC 17025:2010 and/or ISO/IEC 17020:2012, and in accordance with LEG 25 'Microbiological Sample Collection Protocol'.

Microbiological samples may be collected under the following circumstances:

- In designated high risk (*Legionella*) areas and augmented care areas (*Pseudomonas Aeruginosa*) as identified and directed by IP&C
- When HWS and CWS outlet temperatures or biocide levels are persistently outside the recommended limits.
- As a measurement of water quality of the Dental water supply
- As a measurement of water quality of the Renal supply

- As part of 'Building/Area Occupation' procedures.
- Re-sampling following positive biological results.
- Following an isolated significant positive result.
- During an outbreak or suspected outbreak (as instructed by the outbreak investigating officer).
- As part of birthing pool management. See 'Maternity Unit Guideline manual March 2015 edition'.
- Prior to the decanting of Augmented Care patients to alternative Ward/s
- As required by the WSG.

Interpretation of analysis sample results

Analysis Sample	Reported Results	Interpretation of Result
Aerobic count TVCC	None Detected	Negative
	1cfu/ml-999 cfu/ml	Insignificant
	≥1000 cfu/ml	Significant
Legionella	None Detected	Negative
	1cfu/ml-999 cfu/ml	Significant
	≥1000 cfu/ml	Critical
Coliforms and E Coli	None Detected	Negative
	≤1 cfu/100ml	Negative
	≥1 cfu/100ml	Critical

8.4 Water Treatment Regimens

- The water treatment regimens require to be of proven efficacy and substances used in contact with potable water supplies must be listed in the Water Fittings and Materials Directory (WFMD) and compliant with the Water Supply Regulations.
- Chemical conditioning systems, which are used in conjunction with potable water systems should be selected with care. Addition of any substance must not cause a breach of any requirement in the Water Supply (Water Quality) Regulations 1989 (SI 1989 1147) and any system for introducing a substance must be listed in the current edition of the WFMD.
- Consideration should also be given to whether or not the process kills only the organisms flowing through the equipment (leaving no residual disinfecting agent) or whether disinfecting agents are released into the water circuits.

- To ensure adequate filtration and/or reverse osmosis is used to provide a pure water supply free of contaminants, chlorine (in the form of chlorine dioxide for continuous dosing purposes) may be used.
- Water treatment systems should be fail safe and have sufficient instrumentation to monitor their operation
- Regular (monthly) inspection and maintenance of water treatment regimens, including records of inspection and testing both of equipment and water quality should be implemented.

8.5 Disinfection

Disinfection should be undertaken under the following circumstances:

- a) New systems prior to handover
- b) Existing hot water systems where any part of the calorifier or circulation system has fallen below 45°C – Infection Prevention and Control Team should also be informed
- c) Hot and cold systems following any modification

8.6 Cold Water Systems

1. Water softeners (base exchange)

Daily or frequent backwashing, and periodic cleaning and disinfection must be undertaken in accordance with the manufacturer's/supplier's instructions which shall use only proprietary cleaning agents, but these must be acceptable and compatible if the softened supply water serves apparatus such as dialysis units. Regular tests of water softness shall be completed to prove efficacy of the systems. It is important that any treatments are compatible with one another and the patients and processes that they serve.

2. Filtration of potable water

Filtration of potable water to a particle size of 0.2 microns is not uncommon, typically using "dead-end" or "point-of-use" filters or cross-flow membrane filters. Such filters shall not be normally considered a long-term control method, but provide sound short-term solutions. Their use shall be as recommended by risk assessment, or local assessments. The Water Safety Group will assess and evaluate the use and continued use of such filters.

In all cases it is feasible for bacteria to colonise or "grow through" the filter material even where backwashing is a feature. It is essential for filter cartridge elements to be changed at appropriate intervals in accordance with the manufacturer's recommendations, taking into account local conditions. Filter membranes should also be chemically cleaned or replaced at the recommended periods and care must be taken to ensure that the "vessel" or "housing" containing the filter assembly is also disinfected appropriately during filter or membrane maintenance. A method statement will be provided by the contractor.

3. Pressurisation/Supply Pumps

Where two or more pumps are installed for pressurising systems, the pumps should be switched weekly to ensure that any standby or back-up pump is regularly brought into service as the main duty or lead pump, in order to minimise any danger of stagnation.

4. Cisterns and Tanks

The Organisation will comply with the standards in L8, HSG274, SHTM 04-01, The Water Supply (Water Fittings) Regulations, 1999 and WRAS and any other relevant standards current at the time of application.

5. All cold water storage cisterns and cold feed tanks must be examined, cleaned and disinfected regularly, dependent upon inspection. The inspection frequency will depend on site condition, but should be at least on a six monthly basis and any subsequent disinfection should include:
 - Isolating the cistern from the mains supply and the distribution pipe-work. Drain the cisterns;
 - Inspecting each cistern (internally and externally), reporting any foreign objects, biological material, excessive corrosion, deterioration or build-up of debris, configuration, condition etc (lid and insect screens etc) to the nominated person. Then proceed to clean and dry the cistern and carry out any remedial work and/or treatment required.
 - Refilling with fresh water and disinfecting using a recognised, approved method. Drain and flush the cistern to waste until no disinfectant can be detected; all Disinfection processes should follow the manufacturer's recommendations.
 - Checking operation of ball-valve for shut-off at the correct water level and for full discharge flow.
 - Refitting cistern cover, securely refastening and ensuring that suitable screening on pipes open to atmosphere, and overflows exist and sufficient thermal insulation is in place and satisfactory.

6. Non-Mains Water Supplies

Natural water sources such as borehole supplies may be contaminated with legionellae. Sampling for Legionella testing shall be undertaken where such supplies are used.

7. Cold Water Cisterns and Cold Feed Tanks

- All new domestic cold water storage cisterns and tanks shall comply with the requirements of the Water Supply [Water Fittings] Regulations 1999 for cold water storage [heating system header tanks - F&E are excluded].
- This is subject to a risk assessment over a two year programme as required by the new ACoP. The findings of the risk assessments includes prioritised recommendations.
- The actions necessary to bring existing tanks to the standards required by the Water Supply [Water Fittings] Regulations 1999, and timescales appropriate are tabled in the

Legionellosis risk minimisation scheme, and are to be reviewed as part of Legionellosis risk re-assessment.

- All cold water storage tanks with a water storage capacity of greater than 1000 litres containing potable water are to be examined and the temperature tested on a regular six monthly cycle and cleaned on an annual basis as required.
- All other domestic cold water storage tanks are to be examined on an annual basis [where possible to coincide with the annual Legionellosis risk re-assessment exercise], and cleaned and disinfected as detailed in the Tank Cleaning Procedure as required.

8. Connections to Outside Services

The existence of these connections and their necessity is checked on an annual basis.

9. Pressurisation / Supply Pumps

- Where two or more pumps have been fitted for pressurisation systems, the lead pump shall be changed over at least weekly in order to avoid water stagnation.
- Dates and times of the manual pump change-over shall be recorded in the plant room log book. Print-outs of regimes for automatic systems will be adequate.
- Where pumps have not been in service for a period of four weeks or greater, or have been removed for any reason, the pump and associated pipework shall be thoroughly washed out and disinfected before being brought back into service.
- Disinfection of pumps shall be to 50ppm free residual chlorine for 1 hour and pumps shall be totally submerged during this period.
- Incident report record sheet shall be completed giving details of why the pump was out of use. Details of any such action shall be recorded in the plant room log book.

10. Internal Surfaces of cisterns and Tanks

- The material of internal surfaces of cisterns should be listed in the WRc Directory of Water fittings and Materials.
- After thorough cleaning, but before Disinfection, any pitting caused by rust must be cleaned and treated. Care must be taken to ensure that any protective coating is properly air cured after application (as specified in the WRc directory), with particular regard to the number of days necessary to complete the curing process before refilling with fresh water.

11. Temperature checks

The temperature of the cold water storage systems / service should be checked at least twice per year and records maintained. The timing of tests will usually be:

- i) A period of high ambient temperature, probably a warm afternoon.

- ii) During the winter when heating systems are in use.
- Where there are fixed maximum and minimum thermometers, the temperatures are best taken in spring and autumn so that you can record also the summer (highest in autumn reading) and inter (lowest in spring reading).
 - Separate thermometric measuring and recording equipment should be used, that is, independent of any building management system.
 - Any electronic thermometers will be calibrated on an annual basis to the required standard.
 - Borehole water must be regularly bacterial and temperature tested and should not be more than 20°C.
 - Testing the temperature at cold water draw-off points in sinks, wash-hand basins, and baths etc. Ideally, a temperature of not more than 20°C should be reached within two minutes of running (although we will also comply with the guidance in SHTM 04-01 where appropriate).
 - Monthly testing and recording of outlet temperatures at sentinel points on all installed systems.

12. Flushing of Outlets

- All taps within augmented care units should be flushed daily, in the morning in line with current guidance.
- All cold water outlets shall be flushed at least twice per week for a minimum of 3 minute (undertaken by Estates/Housekeeping Department) and records kept of flushing.
- Outlets that are identified as low use (i.e. less than every 72 hours) should be removed and the system pipe-work modified to eliminate any blind-ends or dead-legs. Where the outlets cannot be removed then the outlets should be flushed twice per week in accordance with SHTM 04-01.

8.7 Hot Water Services

1. Hot Water Calorifiers

Calorifiers should be subjected to regular cleaning and maintenance procedures which include the following:

- Yearly draining to minimise the accumulation of sludge.
- Whenever dismantled, for statutory inspection or every year in the case of water/water Calorifiers.
- Calorifiers should be thoroughly cleaned to remove sludge and loose debris and scale.

- Whenever a Calorifier is taken out of service (at least annually for inspection purposes), or its flow temperature falls below the accepted level for any reason the Water Hygiene Group and Organisation Infection Control team & on-call microbiologist must be informed. It should be refilled, drained, refilled again and the entire contents brought up to and held at a temperature of >65°C (preferably 70°C) for at least one hour. A Calorifier shunt pump will significantly reduce the heat-up time.

The Calorifier should remain isolated until the procedure is completed. When bringing Calorifiers back on line, it is important that service valves are opened **slowly** to avoid any disturbance of sedimented debris. Calorifiers which are to be taken out of service for more than a few days should be drained and should not be refilled until ready for return to service, and then should be subject to disinfection. The drain valve should be left open throughout the period the calorifier is out of use;

- Users are reminded that if a Calorifier is colonised by Legionellae and is then drained and opened for maintenance purpose there can be a risk to maintenance personnel of infection;
- Where it is known or established that gross over capacity exists, and where it is practicable to do so, it should be removed.
- Where the draining is not possible, a quarterly blow-down should be carried out.

The storage of domestic hot water should be arranged to ensure that a water outflow temperature of at least 60°C is achieved. It is important to maintain temperatures at above this figure [Legionellae organisms will survive for only a short period of time above this temperature - approximately two [2] minutes].

Permanent continuous monitoring of water temperatures via a building management system or data logger is recommended for higher risk premises in order to demonstrate performance.

The outflow water temperature, under prolonged maximum continuous demand [at least 20 minutes] from calorifiers should not be less than 60°C.

While it is accepted that occasionally under peak instantaneous or prolonged demand that the water outflow temperature will fall, it is not acceptable if this occurs frequently [more than twice in any 24 hour period] and / or for long periods [exceeding 20 minutes].

- Under no circumstances shall the domestic hot water flow temperature fall below 50°C.
- It is recommended that disinfection by pasteurisation is undertaken if the water temperature of the calorifier falls below 45°C.
- The temperatures should be maintained 24 hours a day, seven days per week.
- A minimum domestic hot water circulation temperature of 50°C shall be maintained.

2. Calorifier Operation

Calorifiers in high risk premises such as healthcare are to be run 24 hours per day, 7 days per week, and the domestic hot water circulation pump kept running. Should it be necessary for interrupted operation or shut-down over night, then the calorifier should be allowed to maintain its water storage temperature and the domestic hot water pump should be started up to ensure full temperature through-out the distribution system for at least one hour prior to occupation of the premises.

3. Hot Water Circulating Pumps

- Circulating pumps should be of adequate performance to ensure a minimum circulation temperature of 55°C (flow out from the DHWS vessel of greater than 60°C).
- Only one domestic hot water distribution pump should be installed near the calorifier, and a spare pump kept for immediate replacement in the event of pump failure.
- In circumstances where it is impracticable to remove pumps (that is, when leaving the standby available for immediate connection into the HWS circulating system) the pumps should be switched daily to ensure that any standby or back-up pump is regularly brought into service as the main duty or lead pump. It may be more effective to utilise an auto-changeover system, in which case more frequent switching would be appropriate.
- It is not permissible to shut down the pumped circulation system. To do so will lead to the loss of the required system temperatures.

4. Trace Heating

Electrical trace heating should be checked routinely, at least annually, to ensure that it maintains the water temperature above 55°C, care should be taken to ensure there are no cool spots.

5. Temperature Checks

- During a period of low ambient temperature, check the temperatures of the outflow from the HWS Calorifier to establish that the temperature is above 60°C and that the temperature at the return connection is not less than 55°C. The most distant draw-off point on the system should be checked to ensure that the temperature reaches a steady state value of greater than 55°C within one minute of running the water at full flow.
- The checking of water temperatures at Calorifiers and at sentinel points on a monthly basis.

6. Flushing of Outlets

- All hot water outlets (including thermostatic mixing valves) shall be flushed at least twice each week for a minimum of 3 minute (undertaken by Estates or Housekeeping Department) and records kept of flushing.

- Outlets that are identified as low use should be removed and the system pipe-work modified to eliminate dead-legs.
- Where the outlets cannot be removed then the outlets should be flushed twice per week in accordance with SHTM 04-01 for a minimum of 3 minutes (daily for 5 minutes in the event of a Pseudomonas incident).

7. Thermostatic Mixing Valves

All thermostatic mixing valves (TMV's) shall be inspected and tested for safe temperature control every six months and adjusted, cleaned and disinfected as necessary.

8. Showers

- The showers will be flushed and cleaned at the recommended frequency in the relevant guidance, in a manner that prevents aerosol creation. At time of writing the guidance is that showers and spray taps shall be dismantled, cleaned and removable parts, heads, inserts and hoses cleaned and descaled where appropriate on a quarterly basis or as indicated by the rate of fouling and other risk factors (e.g. patient susceptibility, temperature, previous results, position on pipe-work, frequency of use etc).
- Hyper-chlorination of shower heads, hoses and angle valve strainers has only a short-lived effect on Legionella. Automatic drain valves are ineffective in maintaining a reduction in the number of Legionella in shower water. Regular (at least twice weekly) flushing of showers reduces Legionella proliferation. The most effective management of showers will be achieved by the removal of unnecessary showers and the regular daily use of others.
- All shower heads and hoses will be inspected, de-scaled and disinfected on a quarterly basis as appropriate (see above).

8.8 Servicing and Maintenance

1. General

- All equipment and installations should be regularly inspected, serviced and tested to ensure that they are maintained in a safe and serviceable condition. To achieve this, a comprehensive system of planned maintenance is considered essential.
- All defects and remedial actions should be recorded by a suitable and auditable means (e.g. via Computer Aided Facilities Management software).

2. Planned Maintenance

- The purpose of planned maintenance is to ensure that all equipment and installations used within management's geographical area is maintained in a safe and reliable condition.

- Clear records of all remedial actions taken, all PPMs completed (and performance and progress data), all monitoring records etc. must be provided to the Water Safety Group in the form of a tracker report.

3. Manufacturer's Instructions

It is essential that personnel engaged on maintenance of equipment ensure that they have ready access to the relevant manufacturer's manual and that it is used as the major reference guide to methods of working, dismantling, re-assembly and restoring to service.

4. Newly Commissioned Equipment

All newly installed equipment should have a full and detailed inspection and a complete range of tests and operational checks as part of the commissioning procedure. From a subsequent maintenance point of view the most important factor is to keep careful records of the condition of the equipment and, in particular, to record the initial test results and the actual settings of any adjustable components. Reference to these at future maintenance operations will:

- i) Help in deciding what interval of time should elapse between such operations.
- ii) Provide benchmarks against which all later test results may be judged;
- iii) Allow any deterioration in performance to be recognised and remedial action taken where necessary

5. Frequency of Maintenance

The Responsible Person responsible for the maintenance and servicing will produce a maintenance and inspection schedule which reflects the individual requirements of the equipment.

The schedule will incorporate:

- 1) Routine maintenance proposals, based on periodic inspections supplemented at more extended intervals with operational checks and examination as required;
- 2) Post-fault maintenance, which should be determined by consulting the manufacturer's handbook and by past experience.

8.9 Air Conditioning Plant

1. General

Air conditioning and ventilation plant and duct-work should be inspected at the access point[s] on an annual basis in order to check cleanliness and general condition. After several years of service, even a correctly filtered system may contain dirt accumulation. It may be necessary to consider cleaning of the system. However, accumulation of dirt in a relatively short period of time is indicative of either:

- * poor filter arrangement and design;
- * the use of incorrect filters; or
- * failure of the filtration system.

In particularly polluted areas, it may be necessary to consider the installation of high grade final and pre-filters. The quality of filter housing design and in particular the seals is a critical factor in maintaining the efficiency of the filtration system by ensuring that air does not bypass the filter panels.

All information on condition, cleanliness etc to be recorded in the plant room log book, with any non-compliance or incidents being identified to the Responsible Person [*Legionella*] immediately on identification, and an incident report record form completed.

2. Draining Traps and Pipe-work

- A drainage drip tray should be provided, to collect condensation collecting on cooling coils [including the return bends and headers], and for humidifiers, eliminators and, if necessary, heat recovery devices. The drainage drip tray should be constructed of a corrosion resistant material and be so arranged that it will completely drain - i.e. the drain connection should have no upstand in order to prevent 'pooling'. The drainage tray should be large enough to collect all the water produced by the device it serves. Provision should be made to allow for inspection of the drainage tray [i.e. viewing window / access panel]. Any jointing materials used to seal the drainage tray to the duct must be listed in the Water Fittings Directory and must not be capable of supporting bacterial growth. A slope of 1:20 in all directions towards the drain outlet position should be incorporated.
- Drainage drip trays should be connected to a drainage trap assembly which should discharge via a type A air gap as laid down in BS 6281:Part1:1988.
- The depth of any trap should be at least twice the static pressure head generated by the fan so that the water seal is not 'blown out' during plant start up.
- A trap need not be directly under the drainage drip tray which it serves, provided that the connecting pipe-work has a continuous fall. Each trap shall be made of the clear [borosilicate] glass or transparent plastic type in order to show clearly the integral water seal level, and should be fitted with a screw top cap to permit re-filling. The water seal level shall be permanently marked on the trap, to indicate the water seal

levels when the fan is operational at its design duty. Each installation should incorporate quick release couplings to facilitate easy removal of the traps.

- Traps fitted to plant located outside or in unheated plant rooms may require trace heating to prevent freezing damage during the winter period. The trace heating system employed should not raise the temperature of the water in the trap to greater than 5°C. Similarly, it may be necessary to shield the trap from the direct sunlight of mid-summer in order to prevent heat gain and algal growth.
- The pipe-work from each trap should be constructed of thermoplastic, copper or stainless steel tube. Stainless steel may be particularly useful in instances where greater mechanical strength is required. The pipe-work shall have a minimum fall of 1 in 60 in the direction of water flow.
- Water from each trap should discharge over an open tundish connected to a drainage stack via a second trap, or a floor gully.
- Where the drainage pipe-work from the tundish outlet, which should be ventilated, discharges to a surface water drainage stack or a dedicated plant drainage stack, then the connection shall be in the form of an easy sweep tee.
- It may be necessary to employ chlorine or other chemicals in order to clean humidifiers and cooling coils etc. Under such circumstances it is necessary to discharge the plant effluent produced to the foul drainage system.
- Individual drainage systems should be separate wherever possible.

Humidifiers

- The steam supply connections to the humidifier should be provided with a dirt pocket and trap set installed as close as practicable to the humidifier.
- The water supply to the steam generating unit shall be designed as if potable supply right up to the device.

The humidifier chamber should be inspected on an annual basis and specified in the plant PPM schedule. Particular attention should be given to any pooling of water. The chamber interior should be clean, and free from any scale or other build-up on the walls. It may on occasion for cleaning and / or re-lining to be carried out by a specialist.

Heater Batteries

- Inspection of the heater batteries is necessary in order to ensure free air flow and no build up of dirt, scale or other debris. Cooling coils should be examined regularly in order to ensure that correct drainage is being achieved, and that there is no pooling of water or development of slime, algae or other deposit. Drainage drip trays should be removed [if possible] and cleaned on a regular basis.

Air Handling Plant Inspection

- Plant inspection will be in accordance with the standards in the latest edition of SHTM 04-01, L8 and HSG274, and

8.10 Hydrotherapy Pools, Whirlpool Baths and Whirlpool Spas

1. General

- Hydrotherapy pools, whirlpool baths and whirlpool spas provide conditions which may favour the growth of *Legionella*. Whirlpool spas are particularly vulnerable because of the recirculation of a relatively small volume of water; careful maintenance and chemical water treatment is needed in order to maintain water quality.
- A detailed log must be kept detailing the treatment method, filter cleaning and results of tests for pH, free residual halogen and other key parameters.
- Whirlpool baths employ a single fill for each user, and do not present the same level of risk as spas, provided that the guidance recommended for hot and cold water systems is followed.

2. Guidance

Hydrotherapy pools and spa pools should be operated to the guidance given in the following publications published by the HSE and Public Health Laboratory Service [PHLS]:

- 'Legionnaires' Disease: Controlling the risks associated with using spa baths' [HSE Information Sheet]
- L8 and HSG274 [HSE]
- SHTM 04-01

Copies of these publications should be held in the Estates Department, and used as the primary source of guidance for the management of such pools.

All information on condition, cleanliness, servicing and monitoring to be recorded in a pool log book. Non-compliance or incidents to be identified to the Responsible Person [*Legionella*] immediately, and the incident report record form completed.

8.11 Water Conditioning

As stated, the hot water treatment method used by the organisation is that of full temperature control as advocated in SHTM04-01. However, supplementary treatment is provided by a catalytic chlorine dioxide water treatment regime. To establish the efficacy of the system in its

control of Legionella for each site, a trial was completed to establish:

- A control level;
- The ability to achieve that control level, and;
- The assurance that the control level will be maintained.

Regular Legionella sampling will be required if biocidal treatments are used as an alternative to temperature. Data trends will be analysed at the water safety group meetings.

8.12 Cleaning and Disinfection

Water systems will be cleaned and disinfected under the following circumstances:

System/ Service	Circumstance Requiring Cleaning and Disinfection	Frequency
Domestic cold water tank	New installations.	As required
	Empty tank re-commissioning.	As required
	Tank temperature exceeds 20°C.	As required
	Tank contains moderate sediment, ie a complete covering of the tank base.	As required
	Tank contains moderate corrosion.	As required
	Contamination of tank by vermin or vermin faeces.	As required
	Gross organic contamination e.g. large number of dead insects.	As required
	Regular programme for high risk healthcare category.	Annually
	Regular programme for medium risk healthcare category.	2 yearly
	Regular programme for non-healthcare premises [excluding small tenanted residential properties].	5 yearly
Domestic cold water distribution system	New installations and small modification/ additions.	As required
	Contamination of tank by vermin or vermin faeces.	As required
	Gross organic contamination eg large number of dead insects.	As required
	Consultant advice - interpretation of microbiological results.	As required
Domestic hot water calorifer	New installations and modifications / additions.	As required
	Calorifier falls below 45°C.	As required
	Empty calorifier recommissioning.	As required
	Contamination of header tank by vermin or vermin faeces.	As required
	Regular programme [excluding small tenanted residential properties].	Annually
	Consultant advice - interpretation of microbiological results.	As required

Domestic hot water distribution system	New installations and modifications / additions.	As required
	Contamination of header tank by vermin or vermin faeces.	As required
	Consultant advice - interpretation of microbiological results.	As required
Air handling unit	Contamination by vermin or vermin faeces.	As required
	Gross organic contamination eg large number of dead insects.	As required
	Chiller battery, drip trays and drainage pipework.	6 monthly

8.12 Record Keeping

Records shall be completed and retained for a period of at least 5 years in hard copy and 10 years or more electronically.

Any gaps or non-conformances in record keeping must be addressed by the Hard FM Area Managers.

Retention Period – In addition refer to Log Books A and B

The following types of records are kept.

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

Record Keeping Forms

The following information must be retained for intelligent data collection and audit.

- Temporary Closure of All or Part of a Building
- Indefinite Closure of All or Part of a Building
- Cold Water Tank Inspection
- Water Sampling
- Shower hose and retaining clip replacement
- Flushing Records
- Calorifier / TMV / Sentinel Outlet Temperatures
- Incoming Mains Water Temperatures
- Air Handling Unit Inspection
- Incident Reporting (adverse sampling results)
- Outbreak Reporting
- Calorifier Maintenance

9.0 System Planned Preventative Maintenance Requirements

9.1 Scheme of Control

This control scheme applies to all the domestic water systems at the Organisation.

This Written Scheme should be read in conjunction with the Organisation Policy on Legionella.

9.2 Overview

The Written Scheme is subject to change based on Risk Assessment, Monitoring Results and mechanical changes to the water systems.

See Review Frequencies Table Below

Parameter	Review Frequency	Responsibility	Record Location	Notes
Risk Assessment	Every 2 years, and Annual Audit.	Responsible Person (RP)	Log Book A	
Organisation Policy	Annually	Responsible Person (RP)	Log Book A	
Audit of Compliance	Annually	Responsible Person (RP). Completed by IA/AE	Log Book A	
Schematic Drawings	Annually	TBC	Log Book A	
	When Changed	TBC		
Training	RP / AP – Every year	Responsible Person (RP)	Log Book A	
	CP - Every year	Responsible Person (RP)		
Review Meeting	Quarterly	Responsible Person (RP)	Log Book A	
Records Review and Remedial Actions	As required	AP / RP	Log Book B	
	Weekly	AP / CP	Log Book B	
	Monthly	RP	Log Book B	

9.3 Correct and Safe Operation

The correct and safe operation is detailed below:

Area	No.	Correct and Safe Operation
Hot Water Storage	1	Hot water is stored at 60°C or above 24 hours per day
	2	Hot water calorifiers have a shunt pump installed that operates for at least 1 hour per day anytime between 10pm and 5am as appropriate
	3	Hot water calorifiers are fed with a softened water or have some other scale prevention device installed
	4	Hot water calorifiers are inspected once per annum and cleaned if required
	5	Hot water calorifiers are blown down to removed any accumulated sludge
Hot Water Temperature	5	Hot water is distributed to all outlets and returned to the calorifiers at 55°C or above.
Cold Water Storage	6	Cold water storage tanks comply with Water Fittings Regulations and have less than 24 hours storage
	7	The maximum heat gain between make up and stored temperature in a cold water storage tank is 2°C
	8	Cold water storage tanks are inspected every 6 months and cleaned if required
Cold Water Temperature	9	Cold water is distributed to all outlets at less than 20°C
Stagnation	10	All low use outlets are flushed for a minimum of 2 minutes twice per week (including temporarily closed areas where the water system in the area is part of a larger system). Daily flushing will be completed where Pseudomonas issues and concerns exist for at least 5 minutes
	11	All duty/standby plant is alternated at least weekly
	12	Dead-legs identified are removed within 6 months
Chlorine Dioxide	13	A minimum level of 0.1 (0.2 to 0.5) ppm chlorine dioxide is maintained in both hot and cold water (where safe and appropriate to do so).
Microbiological Monitoring	14	Water is maintained free from all types of legionella bacteria and with a total viable count within EU drinking water guidelines
Showers	15	Shower heads and hoses are kept clean of scale
Plant	16	All plant is installed and maintained to the standards required by ACoP L8 and SHTM 04-01
Mixer Valves	17	All mixer valves are checked and cleaned a minimum of every 6 months
Water Softeners	18	The resin bed is disinfected annually
Hydrotherapy Pool	19	Water is maintained free from all types of legionella bacteria and with a total viable count within EU drinking water guidelines

9.4 Additional Items for High Risk Areas

Where the Risk Assessment and/or the results of routine monitoring as shown that the Risk is significant then the following points are required to ensure safe operation

Hot Water	1	The frequency of stored and distributed water temperature testing is increased as agreed by the Water Safety Group (WSG)
Showers	2	Showers and hoses are removed from service
Microbiological Monitoring	3	The frequency and number of samples is increased as agreed by the WSG
Filtration	4	Filters known to be effective against legionella are fitted at point of use where identified as necessary as required and agreed with the WSG.

Notwithstanding the requirements of the Policy the Water Hygiene Group has the authority to change or increase the scheme of control on water systems deemed to be at increased risk.

9.5 Monitoring, Maintenance and Testing Schedule

Below are listed the tasks carried, the frequency, who is responsible and where the records are located. We will follow the latest standards in HSG274, L8, SHTM 04-01 or any standard current at the time of application.

Task	Specification	Frequency/By Whom	Record Location
Hot Water Storage	Calorifier flow >60°C	Continual on BMS	Log Book B
	Calorifier return >55°C	Monthly/XXXXXXX	
	Shunt pump working	monthly/XXXXXXX	Log Book B
	Water softener - Total hardness less than 10ppm	Daily/XXXXXXX	Log Book B
	Inspect calorifiers and drain water and clean if required	Annually/XXXXXXX	Log Book B
	Blown down until water clear	Quarterly/XXXXXXX	Log Book B
Hot Water Temperature	Sentinel outlets as defined by HSG274 as >55°C	Monthly/XXXXXXX	Log Book B
	Rotational DHW outlets above 55°C	Representative selection on a rotational basis so that the whole system is represented during a year / XXXXXXX	Log Book B
POU Water Heaters	Check temperatures are 55-60°C	Monthly to Six-Monthly based on risk / XXXXX	Log Book B
Cold Water Storage	Cold water storage tanks comply with Water Fittings Regulations and have less than 24 hours storage	Six monthly/XXXXXXX	Log Book B
	The maximum heat gain between make up and stored temperature in a cold water storage tank is 2°C	Six monthly/XXXXXXX	Log Book B
	Inspect tanks, check insulation and clean if required	Six monthly or annually as appropriate /XXXXXXX	Log Book B
Cold Water Temperature	Sentinel as defined in HSG274 and random outlets below 20°C	Monthly/XXXXXXX	Log Book B
	Rotational DCW outlets less than 20°C	Representative selection on a rotational basis so that the whole system is represented during a year / XXXXXXX	Log Book B
POU Filters	These will be used as a short-term solution only. Monthly replace, clean, chlorinate housing etc.	Monthly / XXXXXXX	Log Book B
Stagnation	Flush all low use outlets	Twice weekly or daily as	Log Book B

		appropriate /XXXXXXX	
	Alternate duty/standby plant	Weekly/XXXXXXX	Log Book B
	Identify and remove deadlegs	XXXXXXX (when identified)/As required	Log Book B
Chlorine Dioxide	>0.1ppm in sentinel and random outlets	Monthly/XXXXXXX	Log Book B
Microbiological Monitoring	Take designated hot and cold sentinel and random samples monthly as per schedule and test for TVC, E.Coli, Coliforms, Legionella, Pseudomonas	Monthly/XXXXXXX	Log Book B
Base Exchange Softeners	Visually check salt levels and top up salt, if required. Undertake hardness check. Back-wash (as required)	Weekly	Log Book B
		Back-wash (as required) / XXXXXX	
	Service and disinfect	Six-monthly and / or in accordance with manufacturers guidance / XXXXXX	Log Book B
Expansion Vessels	Where practical, flush through and purge to drain	Monthly to Six monthly as indicated by risk / XXXXXX	Log Book B
Shower heads & hoses	De-scale and disinfect as required and appropriate	Quarterly /XXXXXXX	Log Book B
TMV / Mixer Valve check	Risk assessment of requirement for TMV.	Annual / XXXXXX	Log Book B
	Check inlet temperatures, outlet temperature, failsafe and clean strainer	Bi-annually /XXXXXXX	
Flexible Hoses	Complete a risk assessment as specified earlier and remove where present.	XXXXXXX	Log Book B
Hydrotherapy pool check	Visually clean. No legionella and TVC less than 1000cfu/ml	Quarterly /XXXXXXX	Log Book B

9.6 Additional Items for High Risk Areas

Task	Specification	Frequency / By Whom	Record Location
Hot Water Storage	Calorifier flow >60°C Calorifier return >55°C	Daily / XXXXXXXX	Log Book B
Hot Water Temperature	Sentinel and random outlets above 55°C	Weekly / XXXXXXXX	Log Book B
Microbiological Monitoring	Increase frequency of testing to 4 x normal level	Monthly / XXXXXXXX	Log Book B
Microbiological filtration	Change POU / Pall filters where present.	Monthly / XXXXXXXX	Log Book B

9.7 Temperature and Monitoring Checks

Refer to Log Book B for records.

- Temperature checks on the calorifier and distribution system should be carried out as detailed below on a monthly, six monthly and annual basis. In the event of a non-compliance, the Responsible Person [*Legionella*] shall be informed immediately. Use of a digital thermometer with a touch and immersion probe is recommended.
- Although the HSE recommends spot temperature checks, the SHTM 04-01 requires a temperature excursion limit of less than 20 minutes, therefore continuous monitoring will be necessary in certain circumstances. The frequency of such monitoring to be based on a risk decision [i.e. balance risk, cost and difficulty for the system].
- Cold water storage tank temperatures should be checked during periods of high ambient temperatures [e.g. afternoons between June and August], water temperatures should be no greater than 20°C. At the same time, the furthest and nearest draw off points in the system should be checked to ensure that the water distribution temperatures are less than 20°C within 1 minute of running the water [at full flow]. A similar temperature check regime should be undertaken during the winter months to identify the performance of cold water distribution systems and the impact of heat gain from heating systems.

Hot and cold water distribution temperatures from sentinel taps:

- For domestic hot water services, these are the first and last taps on a re-circulating system. For cold water systems or non-recirculating hot water systems this is the nearest and furthest taps from the storage tank.
- For cold water outlets, the temperature should be below **20°C** after two minutes of running the water. For hot water outlets, the temperature should reach **50°C** within a minute of running the water.

Calorifier flow and return temperatures:

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

Input temperature to thermostatic mixer valves:

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

Incoming mains cold water:

- Where there is a cold water storage tank, this should be measured at the ball valve outlet. The water should preferably be below **20°C**. However, during a prolonged hot summer the incoming water may rise above this temperature.
- Under the Water Supply [Water Quality] Regulations, water utilities are permitted to supply water to premises at temperatures up to **25°C**.
- If incoming water temperatures are above **20°C**, the water undertaker should be advised to see if the cause of the high temperature can be found and removed.
- Monitoring should ideally be carried out so that one check takes place in the summer months and the other in the winter months.

Representative number of taps on a rotational basis:

- In order to ensure that the whole system is reaching satisfactory temperatures for Legionella control, the outlet temperatures should be taken from a representative number of outlets other than sentinel taps.
- For cold water outlets, the temperature should be no greater than 20°C within two minutes of running the water. For hot water outlets, the temperature should reach 50°C within a minute of running the water.
- Where water temperatures fail to satisfy the criteria described, the Responsible Person (Water) shall be informed, and a full investigation must follow.

9.8 Management of Defects

A Formal log book system will be established and maintained up-to-date with a clear audit trail and complete records.

10.0 Procedure for PPM Review and Audit

10.1 Background

The purpose of this procedure is to improve the audit and control of all PPMs and ensure that they are completed on time and any non-compliant responses flagged up at once through the appropriate groups, and where appropriate escalated through the NHS Lothian risk register system.

10.2 Procedure

1. The System generates PPM's;
2. The Estates Manager is responsible for ensuring that all PPM's are allocated to appropriately trained trade staff members, and that these trade staff members have appropriate record keeping forms and calibrated equipment;
3. The Estates CP is responsible for the completion of the PPM's accurately and completely in the time allotted. If for any reasons (including pressures of work load) the trade staff feel that the work cannot be completed on-time, they must immediately raise this point with the Estates Manager / AP. The accurate completion of the PPM records in a timely fashion at the required frequency is essential to our control strategies;
4. All PPM's are being developed into a "cradle-to-grave" format, so that there is a clear easy to follow audit trail when any non compliances are identified. This has involved the addition of the following three columns to the end of all PPM forms thus:

Was the PPM Parameter Recorded Compliant? Yes / No	What Action Has been taken? (Responsible Person / Deputy or Planning Supervisor to complete following agreement)	Post Action PPM Parameter?

5. Each PPM form will now have a sign off at the base. All forms are submitted to the Estates Supervisor / AP who reviews and identifies the non compliant PPM parameters. The form is then passed to the Responsible Person to discuss and agree the remedial actions for immediate implementation. The form is submitted to these individuals prior to each of the monthly "Water Hygiene Group" meetings;

6. When actions are completed the Responsible Person will sign the form off and complete the audit trail elements (additional columns) to record actions taken and post action PPM results to demonstrate the actions were effective;
7. The “Water Hygiene Group” meetings shall be monthly. The review and audit of all PPM sheets will be added as a standing item to the agenda. The meeting will ensure that all PPMs were completed on-time, and examine any non compliant results from the previous PPM exercise. Remedial measures will be agreed (if not already implemented), and will be completed prior to the next months “Water Hygiene Group” meeting;
8. On a quarterly basis the “Water Hygiene Group” meeting will be attended by the independent LCA auditor, who will review the PPMs records. In addition review of records as specified in BS8580 will form part of the annual Legionellosis risk re-assessment;
9. All actions identified in the “Water Hygiene Group” are to be completed by the next group meeting. Where actions are not simple, where end-user susceptibility is high, or when actions fail to work by the next group meeting, then an extraordinary meeting may be necessary, and actions are to be escalated through the Organisation risk register system. In addition these will be reviewed at the water hygiene group meetings;
10. If the issue is not resolved, then a full re-assessment of risk will be completed immediately and additional engineering actions (above those identified as appropriate earlier) will be implemented (e.g. addition of local or central supplementary water treatment or significant pipe-work engineering);
11. Where water PPM’s are not within the required control strategy it is vital that bacteriological monitoring in accordance with L8 and SHTM 04-01 is completed;
12. Where ever such exceptions are identified a brief report shall be created for presentation to the Risk Management Group;
13. All trade staff will receive refresher training on this procedure and the importance of cradle to grave records;
14. When all work is completed and the required PPM parameters are achieved the Responsible Person will check the PPM form, ensure that the clear audit trail can be demonstrated and sign the form off as closed.

11.0 Bacterial Sampling Reaction Protocol

11.1 Background

The Organisation will complete bacterial sampling as identified appropriate through risk assessment, in accordance with SHTM 04-01 and as agreed by the Water Safety Group (WSG). Details of the sampling reaction protocol is provided in **Log Book A**.

The Organisation will complete bacterial sampling as identified appropriate through risk assessment, in accordance with SHTM 04-01 and as agreed by the Water Safety Group (WSG).

Refer to Log Book B for results and trends. Refer to the reaction protocol in **Log Book A** for further details. We will also comply with the PHE Guidance where appropriate.

11.2 General Microbiological/Legionella Sampling in Hot/Cold Water Systems

11.2.1 Circumstances Under Which Samples are Taken

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

- One week following handover of a new building or water system;
- As part of the tank cleaning and disinfection process;
- In response to taste or odour or sustained discoloured water complaints.

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

11.3 Samples for Legionella testing are taken:

- Monthly from hot water systems treated with biocides where storage and distribution temperatures are reduced from those recommended in the HSE's ACOP/Guidance Document L8. At the time of preparation of these procedures, there are no such systems within the organisation;

- Weekly from hot water systems where control levels of the treatment regime, ie temperature in this case, are not consistently achieved – these samples should be taken until the system is brought back under control;
- When an outbreak is suspected or has been identified;
- Regularly where a department specialises in services for “high risk” patients as identified by risk assessment and as agreed by the WSG.

11.4 Action Levels for Legionella in Hot and Cold Water Systems

Legionella Bacteria [cfu/litre]	Action Required
1-100	Investigate and act accordingly.
More than 100 but less than 1000	Either: If only one or two samples are positive, system should be resampled. If a similar count is found again, a review of the control measures and risk assessment should be carried out to identify any remedial actions. If the majority of samples are positive, the system may be colonised, albeit at a low level, with Legionella. Disinfection of the system should be considered but an immediate review of control measures and risk assessment should be carried out to identify any other remedial action required.
More than 1000	The system should be resampled and an immediate review of the control measures and risk assessment carried out to identify any remedial actions including possible disinfection of the system.

11.5 Laboratory competence

Samples for Legionella shall be tested by a UKAS accredited laboratory that takes part in the PHLS Water Microbiology External Quality Assessment Scheme for the isolation of Legionella from water.

12.0 Design Standards and Preferred Solutions

12.1 Background

We have developed a minimum design standards and preferred solutions document, in accordance with L8, HSG274 and SHTM 04-01 and as agreed by the Water Safety Group (WSG). This is a live document and is not repeated here. A copy is held in **Log Book A**.

12.2 Training and Competence of Contractors etc

The Estates Department will require water safety training in accordance with SHTM 04-01.

12.3 Contractor competence/code of conduct

- The roles and responsibilities of contractors involved in the control regime shall be defined in writing, in contract documents. Any agreed deviation from the initial contract documents shall be mutually agreed and documented as part of the contract review process. The competence of such contractors will be assessed.
- The minimum requirement for new contractors shall be registration with the Code of Conduct Association. For Legionella testing laboratory competence see the section of this document dealing with Legionella sampling.

12.4 Design, construction, commissioning and handover

- In order to avoid potentially costly remedial works, the design of new buildings and their water systems is controlled in order to “get it right first time”. The checklist provided in the Appendix, is based on some of the questions contained within an audit checklist used by HSE Inspectors. This checklist should be used by relevant Estates staff and or supplied to design consultants in order that they may check their own designs.
- This checklist is not a design brief and is not intended to deal with all potential design issues, but as a management check. If these issues are incorrect it is likely that other aspects of the design are also not compliant with good or best practice.

13.0 Protection of Maintenance Personnel and Others

13.1 Background

The purpose of this procedure is to improve audit and control of all PPMs and ensure Protection of Maintenance Personnel and Others

13.2 Contaminated Aerosols

- The disinfection procedures presented for cold water storage tanks, domestic hot water vessels and water systems are designed to minimise the risk to staff and others that

may come into contact with water which may have been contaminated with *Legionella sp.*

- In all instances of draining, water should be drained in such a way as to avoid the creation of an aerosol. This also applies for the safe purging of stagnant water eg from unused outlets.
- The appropriate protective clothing should be worn during such procedures. This can be a powered filter and hood, European Class TH3 [assigned protection factor of 40] or a power assisted filter and close fitting full face mask TM3 [assigned protection factor 40]. It should be borne in mind that the filter on these systems is liable to get wet and subsequent resistance to air can increase with consequent discomfort to the operator.
- Alternatively, a hood or full-face mask fed with breathing quality compressed air may be used. The preferred equipment is a full-face close fitting airline mask with a positive pressure demand valve, under a hood or helmet protecting the rest of the head. The air supply should come from an oil free compressor drawing air through a filter from a location well upwind of any jetting operation or using cylinder supplies of compressed air.
- Further information on respiratory protective equipment [RPE] can be obtained from *Respiratory Protective Equipment - legislative requirements and lists of HSE approved standards and type approved equipment* and also *HS[G]53: The selection, use and maintenance of respiratory protective equipment [2nd Edition]*. Personnel using RPE must be adequately trained to do so and equipment must be properly maintained.
- Where possible, cleaning methods which create an aerosol [e.g. high pressure water jets] should be avoided. If this is not possible, the operation should be executed when the building is unoccupied, or in the case of permanently occupied building, windows in the vicinity should be closed and air inlets temporarily blanked off.
- As systems requiring cleaning will have high organic load the operator and others closely involved should wear suitable respiratory protective equipment.

13.3 Other Health and Safety Issues

- If plant is located in confined spaces, reference on entry into confined spaces can be sought from *Safe Work in Confined Spaces Approved Code Of Practice, Regulations and Guidance [L101]*.
- Because water treatment chemicals, including chlorine-containing chemicals and solutions, are often toxic or corrosive they should be used cautiously to ensure that they do not endanger the users or other occupants of the building. Caustic resistant gauntlet type gloves will be required. Water treatment should be carried out by, or under the direction of, people who are suitably qualified and experienced

- The use of water treatment chemicals should be subject to a COSHH assessment and permission would be required from the water authority prior to any discharge to sewers, storm water drains and watercourses. The Environment Agency should be contacted prior to direct discharge to water courses.

13.4 Scalding Risk

With regards to scalding risk the organisation will ensure that all that is reasonably practicable will be done to follow the requirements concerning Safe Hot Water and Surface Temperature in SHTM 04-01.

14.0 Closure of Premises and Occupation of New Premises

14.1 Occupation of New Premises - Procedure Until Occupation

- This procedure is designed to prevent the risk of Legionellosis developing in a new building / department through the interim period following construction, commissioning and hand over to occupancy.
- Design and Build Contracts - outbreaks of Legionnaires' disease have been associated with 'design and build' type contracts, under which the client retains no clerk of works on site and where there is no 'commissioning' period on completion of the work. It is vital that immediately before occupation that cleaning and disinfection is undertaken.
- Once the system is in use and has been cleaned and chlorinated prior to hand over, a Responsible Person shall be nominated to monitor and observe the system, and ensure that the system is operated in accordance with the Organisation's 'Procedure for Temporary Closure' and the relevant record sheets completed.
- At the point of hand over all relevant information on system performance together with as-fitted drawings and design criteria of the domestic hot water systems and cold water services shall be submitted to the relevant Officer who will be responsible for the premises.
- Occupancy of the new property should be as soon after hand over as possible to prevent further costs being incurred due to the need for re-chlorination of the water systems.

14.2 Residential accommodation

This sub-section applies to domestic properties served by individual water systems.

Where domestic properties share a common water system, the procedures for the larger premises apply.

NHS Lothian recognises its obligations as a provider of residential accommodation. In practical terms it fulfils these by routine maintenance checks/actions immediately prior to the occupation.

14.3 Maintenance Actions/Checks Prior to Occupation by a New Tenant

Whenever the expected time delay between vacation of accommodation by one tenant and occupation by the next is greater than one week, the following actions should be taken.

The accommodation unit is visited by a member of the Estates trades staff, within one week prior to occupation. The following actions are taken, in the order stated:

- The hot water system is switched on;
- All WCs are flushed twice [on full flush where dual flush type]
- The cold water storage tank, where present, is checked for gross contamination eg microbiological growth, the presence of organic debris or live organisms such as insects – in the event of discovering such contamination the Estates Helpdesk is informed to arrange tank cleaning and disinfection. The remaining actions below are not undertaken until the cleaning and disinfection of the tank is complete;
- Each hot and each cold water outlet is run for three minutes, creating as little aerosol as possible;
- The shower head is removed and the shower hose run underwater for three minutes;
- The hot water system is left switched on;
- Any defects are reported to the Estates Helpdesk and wherever possible, rectified prior to tenant occupation.

These actions apply to accommodation served by either a conventional hot water system or a combination boiler.

14.4 Provision of Information for New Tenants

NHS Lothian can advise and influence but not control the actions of its tenants. It exerts its influence by the provision of the following guidance as part of the general information pack provided to new tenants.

“The water systems in this accommodation have been prepared by the Estates Department in such a way as to protect water hygiene. You can protect your own health and safety by:

- Ensuring that all outlets are used regularly [preferably once per week] or run for a couple of minutes per week to keep the water fresh;
- Reporting any water system defects, such as hot water temperature failure or dirty drinking water, to the Estates Department as soon as possible”.

14.5 Procedure in the Event of Closure of Part or All of a Building

Where part or all of a building is going to close for a period of greater than one week, the relevant manager must notify the Responsible Person (Water) of the details.

Following a closure decision, negotiations between the relevant manager and the Responsible Person (Water) must take place to ensure that the following procedure is established and documented, and to clearly define what actions named individuals shall perform.

14.5.1 Period of Closure

The period of closure should be established and verified at the earliest point possible. The period for which an area is closed can play an important part on the potential risks, the actions required and cost implications.

Full discussions should take place between the Authorised Person (Water) and the ward/department closing – whether temporary or permanent.

14.5.2 Temporary Closure

- Where a (short term) closure is expected to not exceed 30 days a nominated individual shall be identified to run every tap for 3 minutes and flush every toilet weekly.
- The nominated individual should then complete the record sheet, signed by themselves and their relevant manager, the completed form being forwarded to the Responsible Person (Water)
- Before the closed area is re-occupied the Estates Department shall carry out an inspection and test of the water systems and report its condition to the Responsible Person (Water) for any remedial works that may be required.
- It is the responsibility of the relevant manager to notify the Estates Department of their intention to re-open a temporarily closed area.

14.5.3 Indefinite Closure

- In the instance that part or all of a building is to close with no planned re-opening date, or where the closure period exceeds 30 days, negotiations must be held as detailed in the “background” subsection above, and funding made available to the Estates

Department by the manager of the department that is closing, in order to disconnect and drain the water services within the affected area.

- The relevant manager should be aware that considerable cost for modifications could be needed to achieve this requirement in some large properties.

14.5.4 Detail of Works for an Indefinite Closure

- Where relevant - all water tanks associated with the affected area shall be drained, cleaned and dried out.
- All pipework and devices shall be drained and where applicable domestic hot water calorifiers [or other storage vessels] shall be opened up, cleaned and left open to the atmosphere.
- Pipework shall be disconnected from the mains services and capped off, mains cold water services shall be isolated and capped off from the system and all relevant pipework drained.
- Notices shall be posted throughout the affected area stating that all water services are disconnected.
- The Estates Department shall be responsible to ensure that an adequate water seal exists in unused toilets to prevent odours from the foul drain system entering the premises.
- Adequate records of actions, and amended water service schematic diagrams shall be produced by the Estates Department showing the relevant modifications and disconnections made to the water systems.
- The Indefinite Closure Form shall be used for record keeping purposes.

14.6 Re-occupation of an Indefinitely Closed Area

In the event of re-occupation of an indefinitely closed area, full negotiations must take place between the relevant manager and the Estates Department prior to the re-occupation exercise.

The Estates Department will require the following information:

- The planned re-opening date;
- Any proposed changes of use of the area;
- Any areas which will not be used.

Before the water system is put back into service, any necessary modifications and maintenance shall be carried out prior to the cleaning of the system

15.0 Emergency and Outbreak Actions

The contact details, both during office hours and out-of-hours, of the Responsible Person, and Infection Prevention and Control Team are in **Log-Book A**, and are also kept on the main switchboard and the major incident control room.

15.1 The course of action if an outbreak of Legionnaires' disease is suspected.

- An outbreak is defined by the Public Health Laboratory Service [PHLS] as 2 or more confirmed cases of Legionellosis occurring in the same locality within a six month period.
- NHS Lothian will follow the guidance presented SHTM 04-01 (not repeated in detail here), L8, HSG274 and the PHE Guidance.

The general requirements of SHTM04-01 in response to an outbreak are:

- Investigation of all potential sources of *Legionella* infection;
- Provision, by the Responsible Person, of details of all such equipment identified above;
- The location of any medical equipment used for dental care, respiratory therapy and haemodialysis.
- Off-site information such as excavation or earth moving works, alterations to water supply and drainage;
- The contact details of the nearest weather station;
- Provision of advice on cleaning, disinfecting, modification and long term control measures for the responsible equipment.

16.0 Log Book Formats

As stated earlier this Water Safety Procedure / Scheme of Control is supported by a Log Book System. The structure of key documents is explained in Figure 1 earlier. The log-book contents are listed below.

Section:	Title:	Contents:
LOG-BOOK A – MANAGEMENT LOG-BOOK (RP)		
1	Think	1.1 Introduction, purpose and scope
		1.2 Risk Assessments
		1.2.1 Engineering
		1.2.2 Clinical
		1.3 Water Safety Audit
		1.4 Appointments Evidence and Training
		1.5 Water Safety Group Terms of Reference and Minutes
		1.6 Asset List
2	Plan	2.1 Water Safety Action Plan
		2.2 Water Safety Policy
		2.3 Water Safety Procedures / WSP/ Scheme of Control
3	Guidance	3.1 L8 and HSG 274
		3.2 SHTM 04-01
		3.3 BS8580

LOG-BOOK B – IMPLEMENTATION LOG-BOOK (AP)		
4	Act	4.1 Engineering Standards Document
		4.2 PPMs
	Review	5.1 Review Process
		5.2 Sampling & Monitoring Results and Trends

5		5.3 Log Sheets & Records
		5.4 Water Service Schematics
6	H&S Info	6.1 COSHH information
		6.2 Access Information

17.0 Appendices – refer to Hard FM Shared Drive (K)