



**23A Upton Grey Close**



**23B Upton Grey Close**

## CONTENTS

INTRODUCTION	Page 3
BACKGROUND TO LEGIONELLA	Page 4-5
REVIEW COMPLIANCE	Page 6
SITE REVIEW & PHOTOGRAPHS	Page 7-21
HOT & COLD WATER TEMPERATURES	Page 22-23
RECOMMENDATIONS & SUMMARY	Page 24-30

## INTRODUCTION

This report relates to a **Review** of the Legionella Risk Assessments that were carried out by Freeston Water Treatment in April 2009; these were the latest Risk Assessments for these buildings. The Review Survey was carried out at 23A & B Upton Grey Close, Harestock, Winchester, Hants SO22 6NE. The Review of Recommendations highlighted in the previous Risk Assessments was undertaken in order to comply with the Health and Safety Executive requirements on the control and prevention of Legionellosis. This Review has been carried out as asked for by Hampshire County Council in accordance with ACoP L8 'The control of Legionella bacteria in water systems' (APPROVED CODE OF PRACTICE & GUIDANCE) only.

The Review has been limited to the terms of reference agreed between Hampshire County Council and Freeston Water Treatment Ltd. Observations relating to system conditions and other factors applicable to the requirements of L8 have been recorded during the Survey and specific references are made to compliance with the ACoP in the Observations section of the report.

A recommendations section concludes the report. ACoP L8 places responsibility on employers and others to prepare a scheme for preventing or controlling the risk from Legionellosis. Adoption of a monitoring scheme in conjunction with a regime of preventative maintenance and associated record keeping will meet these requirements.

## BACKGROUND TO LEGIONELLA

Legionella is the bacterium that causes Legionnaires disease. Of this bacterium, Legionella pneumophila is the species most commonly associated with disease outbreaks. Legionnaire's disease is identified as a pneumonia type of infection of the lower respiratory tract. The infection is most commonly acquired by the inhalation of airborne droplets or particles containing viable Legionella. Exposure to Legionella can also cause a short feverish illness without pneumonia, known as Pontiac Fever.

Research and investigations indicate that the occurrence of Legionella contamination is greatest in water cooling towers, evaporative condensers, hot and cold water services, water spray humidifiers, air washers, spa baths and pools where water is agitated and re-circulated. The contamination from a cooling water tower will cover a far larger area than any other likely source.

Sediment, scale, and organic materials present in water systems can provide nutrients and give protection for Legionella. Legionella has been shown to colonise certain types of water fittings, pipe work and materials used in the construction of water systems. The presence of these materials may provide nutrients for Legionella and make eradication difficult. Other organisms in water systems such as bacteria, amoeba and algae can provide a suitable habitat and nutrients in which Legionella can survive and multiply.

The formation of biofilms within water systems is undesirable and may also provide harbourage and favourable conditions for Legionella growth. The presence of Legionella in biofilms and in enclosures within protozoa may protect the organisms from any remedial measure employed to eradicate the bacterium.

Legionella is most likely to proliferate in water systems that have a temperature between 20°C and 50°C. Human blood temperature of approximately 37°C is the most ideal temperature for proliferation. Stagnant water within the above temperature range appears to provide the ideal conditions for proliferation of Legionella.

Legionella will survive at temperatures below 20°C but is considered to be in a dormant state with no growth activity. The bacterium does not survive temperatures maintained consistently at 60°C or above.

## REVIEW COMPLIANCE

The Review was commissioned in order to identify and assess the risk of Legionellosis from the water sources on the premises using the previous Risk Assessment. General and specific observations on the systems made during the course of the Survey are also recorded and the more general requirements of L8 are also commented on where applicable.

The specific observations made in this Review, together with the most recent Risk Assessment should be read in conjunction with the practices and procedures detailed in the recommendations section and also with ACoP L8.

The Assessment should be reviewed regularly (at least every two years) and whenever there is reason to suspect it is no longer valid. An indication of when to review the Assessment and what needs to be reviewed should be recorded.

This may result from example:

Changes to the water system or its use

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

The availability of new information about risks or control measures

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

A case of Legionnaires disease/Legionellosis is associated with the system

## SITE REVIEW

**This Review relates to observations made and information supplied from the existing Risk Assessment together with information supplied by others.**

During this Review Survey it was identified that a new water systems logbook has been issued for 2011 by Hampshire County Council; the logbook was seen to be in a poor state as monitoring was found to be very intermittent. It was seen that virtually all monitoring and checks have not been carried out since May 2011 this is not satisfactory and must be addressed as soon as possible. There have been no audits carried out on the logbook documentation by the site managers to determine if monitoring is being carried out; the single logbook covers all buildings from 23A & B, 25 and 27 Upton Grey Close. The duty holder, responsible persons and operational staff have been nominated in writing within the logbook.

There are in total four buildings that require monitoring and checks to be carried out; there is no monitoring being carried out on the hot water calorifiers in any of the buildings; the last records seen in the logbook were for February 2011; the flow and return temperatures should be monitored every month and recorded; this must be carried out and started as soon as possible.

Monthly temperature monitoring of the hot and cold water systems within the four buildings has only been carried out in February, April and May 2011; no monitoring has been carried out since May 2011 this is not satisfactory and must be addressed as soon as possible.

Flushing of the four buildings water outlets as well as infrequently used outlets has been carried out and recorded within the logbook documentation; this does not appear to be being carried out weekly. It appears from the records that some flushing is carried out fortnightly and again it appears from records that this was last carried out in May 2011; this is not satisfactory and should be addressed as soon as possible.

Showerhead cleaning and disinfection is being carried out but it is not being carried out on a weekly basis as recommended by Hampshire County Council; again this appears intermittent. Showerhead descaling records show that not all showerheads are being descaled again the showerhead cleaning and descaling was last carried out in May 2011.

TMV monitoring is not being carried out within the four buildings; records indicate that the last TMV monitoring was carried out in February 2011; this is not satisfactory and should be addressed as soon as possible.

TMV servicing appears to be being carried out on an annual basis by contractors EMCOR this was last carried out in May 2011; certification was seen filed in a separate folder.

Cleaning and disinfection has been carried out on the cold water storage tanks within 23A & B in October 2010; certification for this was seen filed in a separate folder. Records indicate that only two tanks within 23A were cleaned and disinfected. There were no records seen for water storage tank inspections being carried out within 23A & B; this must be carried out on a six monthly basis.

It is of paramount importance that all monitoring and checks are carried out and kept up to date; this will be achieved if regimes are put in place and the monthly logbook audit is carried out by the site manager. I would recommend the site be issued with a good digital thermometer and the appropriate probes to carry out monitoring correctly.

## COLD WATER STORAGE

### Building 23A

There are three domestic cold water storage tanks located within the roof void of this building; no.1 & 2 storage tanks are of plastic construction and have poly fibre jackets for insulation; this was in a fair condition. Both storage tanks have fitted lids with screened vents; there is still a returning vent pipe to no.2 storage tank; this was recommended for re-routing in the original Risk Assessment but has not been carried out. There is a partial cross flow of water through tank no.1 and also through tank no.2; no.1 tank is fitted with a ball valve but no.2 tank has no ball valve and internal inspection proved there to be a heavy build up of surface stagnation.

Internal inspection of no.1 tank proved there to be a build up of sediment and scale; both of these tanks have labels to indicate they were both cleaned and disinfected in October 2010; I would recommend this is carried out annually if required. Both storage tanks no.1 and 2 are linked and are also linked with storage tank no.3 through the distribution pipe work.

No.3 storage tank is located behind tanks no.1 & 2 and is of GRP construction with integral insulation. The ball valve supply to this tank is shut off as it was when reported in the original Risk Assessment; this creates deadleg pipe work on the mains water supply pipe work.

Internal inspection of this tank proved there to be a heavy build up of surface stagnation and sediment; there is no label on this tank to indicate that it was cleaned and disinfected in October 2010. I was unable to determine if this tank is in use as the outlet has no valve handle; I would recommend an investigation on this tank to determine if required and if still in use as the ball valve is isolated there is no movement of water within the tank creating stagnation.

The water temperature of 23A water storage tanks at the time of this Review Survey was:

No.1 Plastic Storage Tank	19.7°C	This is Satisfactory
No.2 Plastic Storage Tank	20.6°C	This is Not Satisfactory
No.3 GRP Storage Tank	19.9°C	This is Satisfactory

### Building 23A

Water storage tanks no.1 & 2 located in roof void. Tank no.2 still has returning vent pipe work; recommend re-routed to drain or tundish.



Internal view of no.1 water storage tank at the time of this Review. Build up of sediment and scale; last clean and disinfection was in October 2010; clean and disinfect annually if required.



Internal view of no.2 water storage tank at the time of this Review. Heavy build up of surface stagnation and also sediment on base of tank. No ball valve fitted consider plumbing arrangements to prevent stagnation. Recommend tanks removed and all cold water services supplied directly from the mains water service.



Water storage tanks no.3 located in roof void behind tanks 1 & 2. Tank should be investigated to determine if still in use or required. Main isolated to ball valve creates deadleg pipe work. Are distribution outlets open? No label to indicate if storage tank was cleaned and disinfected in October 2010.



Internal view of no.3 water storage tank at the time of this Review. Heavy build up of surface stagnation and also sediment on base of tank. Ball valve is isolated consider plumbing arrangements to prevent stagnation. Recommend tanks removed and all cold water services supplied directly from the mains water service.



Clean and disinfect all storage tanks annually if required.

## HOT WATER STORAGE

### Building 23A

Hot water storage within building 23A is by one calorifier located within the airing cupboard on the first floor; the calorifier is an immersion type heated by the LTHW boiler and also has a single electric element as back up sited on the top of the vessel. The calorifier has factory fitted foam for insulation and is also fitted with a return system; the return is fitted with a single pump. There was seen to be no insulation fitted on the flow and return pipe work within the cupboard space to prevent heat loss; I would recommend this is fitted.

As previously mentioned there is no monitoring being carried out on the calorifier flow and return pipe work; no temperature gauges have been fitted as recommended in the original Risk Assessment. It was recommended in the original Risk Assessment that the calorifier be purged to drain on a six monthly basis this is not being carried out.

At the time of this Review the calorifier flow and return temperatures were found to be very low this should be addressed as soon as possible.

Domestic water services should operate at temperatures that prevent the proliferation of Legionella. L8 specifies that hot water should be stored at no less than 60°C and distributed at no less than 50°C, obtainable at user outlets within one minute of opening.

Building 23A calorifier flow and return temperatures at the time of this Review were:

Calorifier Flow	40.0°C	This is Not Satisfactory
Calorifier Return	39.0°C	This is Not Satisfactory

Hot water should be stored at 60°C at all times; I would recommend adjustment to achieve this. The hot water return temperature should be maintained at 50°C or more at all times.

**Building 23A**

Hot water calorifier located in the first floor airing cupboard space. Start temperature monitoring of the flow and return temperatures on a monthly basis as soon as possible.



Maintain storage at 60.0°C.

Hot water calorifier circulating/return pump. Start temperature monitoring of the flow and return temperatures on a monthly basis as soon as possible.



Maintain return temperature at 50.0°C or more at all times.

## COLD WATER STORAGE

### Building 23B

There are two domestic cold water storage tanks located within the roof void of this building; no.1 & 2 storage tanks are of GRP construction and have integral insulation; both tanks are linked through common distribution pipe work. No.2 tank was not accessed at the time of this Review due to restricted access the rear tank is very awkward to access for cleaning and maintenance. Upon internal inspection of tank no.1 the front tank this was proved to be in a good clean condition; this tank is the only tank labelled to indicate it was cleaned and disinfected in October 2010; the rear tank has no label to indicate it was cleaned and disinfected.

It was recommended in the original Risk Assessment that the returning vent pipe work be re-routed to a drain or tundish this has not been carried out. No.1 tank has had a screened vent fitted in the lid but there is no screened vent fitted to no.2 tank lid; there is a cross flow of water through both tanks.

**The water temperature of 23B water storage tanks at the time of this Review Survey was:**

**No.1 Storage Tank    23.2°C    This is Not Satisfactory**

**No.2 Storage Tank    No access gained to tank**

Consideration should be given into the removal of these storage tanks and serve all cold water from the mains water services; this would remove the risk of stored water.

**Building 23B**

Water storage tanks no.1 & 2 located in roof void. No access to rear tank no.2 at the time of this Review due to limited access space. Only no.1 tank has cleaning and disinfection label last cleaned and disinfected in October 2010.



Internal view of no.1 water storage tank at time of this Review. Last clean and disinfection was in October 2010; clean and disinfect annually if required.



Tank no.1 still has returning vent pipe work; recommend re-routed to drain or tundish.



## HOT WATER STORAGE

### Building 23B

Hot water storage within Building 23B is by one calorifier located within the airing cupboard on the first floor; the calorifier is an emersion type with approximately 184 litre capacity and heated by the LTHW boiler; the calorifier also has a single electric element as back up sited on the top of the vessel. The calorifier has factory fitted foam for insulation and is also fitted with a return system; the return is fitted with a single pump. There was seen to be no insulation fitted on the flow and return pipe work within the cupboard space to prevent heat loss; I would recommend this is fitted.

As previously mentioned there is no monitoring being carried out on the calorifier flow and return pipe work; no temperature gauges have been fitted as recommended in the original Risk Assessment. It was recommended in the original Risk Assessment that the calorifier be purged to drain on a six monthly basis this is not being carried out.

Domestic water services should operate at temperatures that prevent the proliferation of Legionella. L8 specifies that hot water should be stored at no less than 60°C and distributed at no less than 50°C, obtainable at user outlets within one minute of opening.

**Building 23B calorifier flow and return temperatures at the time of this Review were:**

Calorifier Flow	56.0°C	<b>This is Not Satisfactory</b>
Calorifier Return	54.0°C	<b>This is Satisfactory</b>

Hot water should be stored at 60°C at all times and the hot water return temperature should be maintained at 50°C or more at all times.

**Building 23B**

Hot water calorifier located in the first floor airing cupboard space. Start temperature monitoring of the flow and return temperatures on a monthly basis as soon as possible.



Maintain storage at 60.0°C.

Hot water calorifier circulating/return pump. Start temperature monitoring of the flow and return temperatures on a monthly basis as soon as possible.



Maintain return temperature at 50.0°C or more at all times.

## GENERAL

It was recommended in the original Risk Assessment that the adjustable showerheads within buildings 23A & B be replaced with new non adjustable showerheads this has not been carried out. I was informed that the procedures implemented by Hampshire County Council regarding the cleaning and disinfection and descaling are not being carried out as recommended.

All tap outlets and infrequently used outlets within buildings 23A & B are not being flushed on a weekly basis it appears to be being carried out sporadically and has not been carried out since May 2011.

Scale build up on tap outlets can act as a nutrient for bacteria proliferation; I would recommend that tap outlets be cleaned and descaled on a regular basis.

The TMV's within buildings 23A & B are being serviced and maintained by contractors EMCOR; this was last carried out in May 2011; it is assumed this is carried out annually.

It is unknown when Legionella or bacteriological samples were last taken; it was recommended in the Risk Assessment that this is carried out on an annual basis or more frequently in areas with 'at risk patients', for example those who are Immuno-Compromised; no records were seen for water sampling at the time of this Review.

**General**

Ensure all showers within buildings 23A & B are used on a regular basis or flushed at least on a weekly basis; record when carried out.



It was recommended in the original Risk Assessment that all showerheads are changed to the non adjustable type.



Ensure all showerheads within buildings 23A & B are cleaned and descaled at least quarterly or as required.

Ensure all TMV's are being serviced, maintained and adjusted if required; record when carried out.



## HOT & COLD WATER TEMPERATURES

Domestic water services should operate at temperatures that prevent the proliferation of Legionella. L8 specifies that hot water should be stored at no less than 60°C and distributed at no less than 50°C, obtainable at user outlets within one minute of opening. Cold water should be stored and distributed at no more than 20°C.

The following water temperatures were taken at random as follows:-

Building 23A Ground Floor Toilet and Shower Room Wash Basin		
Hot	39.0°C	Not Satisfactory
Cold	21.3°C	Not Satisfactory
Ground Floor Kitchen Wash Basin		
Hot	39.2°C to TMV 39.2.0°C from TMV	Not Satisfactory Satisfactory
Cold	20.5°C	Not Satisfactory
Ground Floor Laundry Sink		
Hot	39.6°C to TMV 39.60°C from TMV	Not Satisfactory Satisfactory
Cold	20.0°C	Satisfactory

TMV temperature reference is from NHS Estates Guidance (1988) and Thermostatic Mixing Valve Manufacturers Association (TMVA).

Low hot water temperatures recorded and elevated cold water temperatures recorded; this should be investigated and addressed as soon as possible.

<b>Building 23B Ground Floor Laundry Sink</b>		
Hot	55.7°C to TMV 45.5°C from TMV	Satisfactory Not Satisfactory
Cold	23.3°C	Not Satisfactory
<b>Building 23B First Floor Empty Bedroom Wash Basin</b>		
Hot	54.5°C to TMV 45.9°C from TMV	Satisfactory Not Satisfactory
Cold	23.5°C	Not Satisfactory
<b>Building 23B First Floor Toilet Wash Basin</b>		
Hot	54.6°C to TMV 49.6°C from TMV	Satisfactory Not Satisfactory
Cold	23.3°C	Not Satisfactory

TMV temperature reference is from NHS Estates Guidance (1988) and Thermostatic Mixing Valve Manufacturers Association (TMVA).

Elevated cold water temperatures recorded at the time of this Review; this should be addressed as soon as possible.

## RECOMMENDATIONS & SUMMARY

### During the Risk Assessment several items were recommended for buildings 23A and B

**Commence temperature monitoring of the domestic hot and cold water systems and record in the logbook when carried out.**

This has not been carried out correctly on a monthly basis and has not been carried out since May 2011. I would recommend this is addressed as soon as possible

**Clean and disinfect cold water storage cisterns as soon as is practicable and repeat annually if required.**

This was carried out in October 2010 but not all tanks have labels to indicate they have been cleaned and disinfected. Recommend this is carried out annually if required.

**Refit insulation to tanks 2 & 3 in 23A.**

This appears to have been carried out.

**Fit WRAS approved screened vent to lid on cistern no. 3 in 23A.**

This appears to have been carried out.

**Remove dead legs on cistern no. 1 and drain water down in 23A.**

This has not been carried out.

**Remove calorifier vent pipes and pipe to a foul drain via an air gap in 23A & 23B.**

This has not been carried out.

**Fit ball valve and inlet to cistern no. 3 to give surface agitation or remove cistern if deemed feasible in 23A.**

This has not been carried out.

**Ensure calorifier is adjusted to achieve a storage temperature of 60°C and return temperature of 50°C.**

This has not been carried out.

**Manually check domestic circulating pump on boiler monthly to ensure effective operation.**

No record of this being carried out.

**Twice weekly flushing of all low use infrequently outlets - showers, toilets, hand basins, sinks, hose reels etc and record when carried out.**

All tap outlets and infrequently used outlets are not being flushed weekly and has not been carried out since May 2011.

**Bacteriological and Legionella water samples to be taken annually or more frequently if temperatures fall outside limits or the Centre has 'at risk' clients.**

No record of any water sampling being carried out.

**Clean and disinfect showerheads quarterly. Record when carried out.**

Showerheads are not being cleaned and disinfected weekly and descaled on a quarterly basis as implemented by Hampshire County Council; it has been carried out intermittently and was last carried out and recorded in May 2011.

**Thermostatic mixing valves are to be serviced and maintained as per the manufacturer's recommendations.**

This appears to be carried out annually by contractors EMCOR; this was last carried out in May 2011.

**Thermostatic mixing valves to be adjusted to achieve the correct outlet temperatures as set out in HTM 04-01.**

This is carried out at the time of the service visit.

**Replace adjustable showerheads with non adjustable items as recommended in HTM 04-01.**

This has not been carried out.

**Ensure washing machines are appropriate WRAS approved healthcare units.**

It is assumed the washing machines are appropriate for these care units.

**Remove dead legs in 23A.**

This has not been carried out; deadlegs assumed on the water storage tank pipe work on rear tank.

It is recommended that the following are carried out:-

- Start with all current procedures implemented by Hampshire County Council and record in water systems logbook as soon as possible.
- Start monthly temperature monitoring of all domestic sentinel hot and cold water and additional outlets in all buildings and record in water systems logbook as soon as possible.
- Continue to clean and disinfect cold water storage tanks and continue annually if required. File certification in water systems logbook when carried out.
- Start monthly temperature monitoring of the hot water calorifiers flow and return temperatures in all buildings and record in water systems logbook as soon as possible.
- Start weekly and twice weekly flushing of all tap outlets and infrequently used outlets in all buildings as soon as possible.
- Start purging all calorifiers to drain on at least a six monthly basis and record in the water systems logbook when carried out.
- Inspect all cold water storage tanks on a six monthly basis and take water temperature from tank and ball valve and record in water systems logbook.
- Bacteriological and Legionella water samples to be taken annually or more frequently if temperatures fall outside limits or the buildings have 'at risk' clients.

- Continue servicing and maintaining TMV's in all buildings carry out adjustment to achieve correct water temperatures where required.
- Ensure all staff have up to date Legionella awareness training as soon as possible.

## SUMMARY

As reported a new water systems logbook has been issued by Hampshire County Council for 2011 for buildings 23A & B, 25 and 27; one logbook is being used for all buildings and was found to be in a poor state due to the fact the procedures implemented by Hampshire County Council are not being carried out. The ACoP L8 recommends that monitoring of all domestic water systems be monitored and recorded in a water systems logbook; this should be addressed as soon as possible.

It should be ensured that all monthly hot and cold water systems in all buildings are monitored and recorded in the logbook documentation; this must be started as soon as possible. The calorifier flow and return monthly temperature monitoring in all buildings must be started as soon as possible and recorded in the water systems logbook; the circulating return pump should be checked for the correct operation on a monthly basis; this should be carried out in all buildings.

As recommended by Hampshire County Council weekly and twice weekly flushing of all tap outlets and infrequently used outlets in all buildings should be started as soon as possible and recorded when carried out.

I would recommend that the site staff be supplied with a digital thermometer with the appropriate immersion and surface probes to carry out monitoring of the calorifiers correctly. Both probes can be used to carry out temperature monitoring of the tap outlets and also for the monitoring of the TMV's which at present is not being carried out. Sentinel TMV's should be monitored on a monthly basis and recorded in the water systems logbook when carried out.

It should be ensured that the water systems logbook be audited on a monthly basis by the site manager and the relevant section in the logbook be signed when carried out; this will ensure all the checks and procedures that are in place are being carried out and are maintained up to date.

It was recommended in the last Risk Assessment that all adjustable showerheads be replaced with the non adjustable type; this has not been implemented.

I would recommend that the procedures and checks that have been implemented be started; and recorded within the logbook documentation. I would also recommend that all staff have up to date Legionella Awareness training.

I would recommend consideration be given into the removal of the cold water storage tanks in 23A & B and serve all cold water directly from the mains water services; this would take away the risk of stored water. Plumbing arrangements should be investigated for the storage tanks in 23A and to determine if the rear tank is required as ball valve is isolated. Investigate elevated cold water storage temperatures within 23A & B possible lack of water turnover.

It must be ensured that all hot water calorifiers in all buildings are adjusted to store hot water at 60.0°C and the return to maintain 50.0°C or more at all times.