

CONTENTS

PREFACE	Page 2
INTRODUCTION	Pages 3 - 4
BACKGROUND TO LEGIONELLA	Pages 5 - 6
ASSESSMENT OF RISK	Pages 7 - 8
REVIEW OF RISK ASSESSMENT AND OBSERVATIONS	Pages 9 - 18
SITE SURVEY HOT & COLD DISTRIBUTION	Pages 19 - 28
WATER DISTRIBUTION TEMPERATURES	Pages 29 - 32
GENERAL, RECORDS AND ADDITIONAL PHOTOGRAPHS	Pages 33 - 38
SUMMARY OF RECOMMENDATIONS	Pages 39 - 43

PREFACE

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Date of Assessment: 4th December 2013

Date of Review: December 2015

INTRODUCTION

This report relates to a water source Risk Assessment Review of the Risk Assessment carried out by Mr Peter Smith of Freeston Water Treatment Ltd on the 14th February 2007 and Mr Chris Wilson on the 28th November 2007 on behalf of Marina Developments Ltd.

The First Risk Assessment Review survey was carried out by Mr Chris Wilson of Freeston Water Treatment Limited on the 4th October 2011.

This Second Risk Assessment Review survey was carried out by Mr Chris Wilson of Freeston Water Treatment Limited on the 4th December 2013 at Northney Marina, Northney Road, Hayling Island, Hampshire PO11 0NH.

At the time of the 2007 Risk Assessment, access could not be gained to Main Building Units 006 and 010, Flats 2, 4, 6, 7 and 8.

At the time of the 2011 Risk Assessment Review I was informed that there is no water within Units 8 and 10.

At the time of the 2011 Risk Assessment Review, access could not be gained to Units 2, 6 and all of the Outside Block.

The Teal and Mallard buildings have their own water meter and I was informed that because of this the tenants are responsible for their own water and therefore they were not included in the survey.

At the time of the 2013 Risk Assessment Review access was gained to all areas needed.

The Review of Recommendations highlighted in the previous Risk Assessment were 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 in accordance with ACoP L8 'The control of Legionella bacteria in water systems' (APPROVED CODE OF PRACTICE & GUIDANCE) and BS 8580 (RISK ASSESSMENTS FOR LEGIONELLA CONTROL-CODE OF PRACTICE).

The Review has been limited to the terms of reference agreed between Marina Developments Limited 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, pipework 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.

For water samples collected and returned to the laboratory, Legionella pneumophila is recovered by propagation of the organism on a specially supplemented nutrient growth medium. Such samples are normally then incubated at around 37°C. It may take up to 7 days for colonies of Legionella to appear. Legionella can be recognised by visual examination of the colonies followed by a number of laboratory techniques to identify species and serogroup.

ASSESSMENT OF RISK

Rationale

Legionnaire's disease is most commonly caused by the inhalation of water droplets contaminated with the Legionella bacteria. It is therefore important that systems susceptible to colonisation by Legionella and which incorporate a potential means for creating and disseminating water droplets should be identified and the risk they present assessed. ACoP L8 requires this identification and assessment.

The assessment must be completed for routine system operation and also for circumstances such as breakdown, abnormal operation, commissioning or other unusual circumstances.

Once the assessment has been completed, a strategy can be prepared for preventing or controlling the risk. The strategy will be based on a sound knowledge of the varying levels of attention required by the differing risk sources within the building.

The assessment takes account of:

- A) The potential for formation of droplets.
- B) The condition of the water.
- C) Water temperature.
- D) The water turnover rate.
- E) The susceptibility of persons exposed to droplets.
- F) The population density exposed to droplets.

Water droplets are normally created in various ways such as by spraying, bubbling and following impact onto hard surfaces. Large drops may be reduced to irrespirable size by further impact or evaporation. Smaller particles can remain airborne for long periods and will be carried on air currents.

In undertaking the Risk Assessment and drawing up precautions, particular attention must be paid to situations where:

- 1) The population exposed contains a relatively high number of people susceptible to Legionella, for example in Hospitals and Nursing Homes.
- 2) The density of population is high and therefore the number of people at potential risk is high.

The Risk Assessment should be reviewed whenever there is reason to believe that the original assessment may no longer be valid and ideally an annual review of all sources should be undertaken. The original assessment may be compromised if:

- 1) Changes are made to plant or water systems or its use.
- 2) Changes are made to building use in which the water system is installed.
- 3) New information about risks or control measures becomes available.
- 4) Results of checks indicate that control measures are no longer effective.

Once a risk has been identified and assessed, a scheme should be prepared for preventing or controlling it. The risk is heightened when conditions are not monitored and control of the system is lost, thereby allowing Legionella to proliferate. The scheme should be implemented together with a planned preventative maintenance schedule in line with that contained within the general recommendations section of this report. This will meet the requirements of the ACoP.

REVIEW OF RISK ASSESSMENT AND OBSERVATIONS

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.

Compliance with ACoP L8 may be classified into two distinct categories:

- a) Management Procedures - The management procedures which have been implemented to ensure that all control measures, record keeping and monitoring are adequate and effective.
- b) Systems Conditions - The physical conditions of the water systems in the building must be considered when assessing the risk from Legionellosis.

This report therefore addresses the above categories. A general overview of existing Management Procedures is included and followed by comprehensive observations of the Systems Conditions as seen during the course of the Survey.

General Management Compliance

ACoP L8 para 23 - Identify Sources of Risk

Observations

The Survey was commissioned in order to identify and assess sources of risk from the water storage and distribution systems in the premises and this Review highlights the remedial works and recommendations from that Report.

Further Action

Following receipt of the Review, all recommendations and remedial work should be carried out at the earliest opportunity.

General Management Compliance

ACoP L8 para's 39, 53 and 66 - Prepare a Scheme for Preventing or Controlling the Risk - Implement and Manage Precautions - Maintain Records

Observations

A regime of repair and breakdown maintenance should be operational on the site for all of the water services and systems. Direct labour and contract staff should undertake the work. Procedures and records for the various maintenance activities must be documented and the particular procedures relative to the control of Legionellosis are documented within an operational logbook.

Further Action Required

A written scheme for preventing or controlling the risks from Legionellosis identified in the Risk Assessment must be drawn up to maintain and provide a monitoring function for the relevant equipment and water systems.

A written scheme contained within the logbook must be implemented and monitored in order to meet the requirements of ACoP L8.

A logbook system will meet the requirement for maintaining records of precautions implemented. The logbook documentation should include:

- Definition of Management responsibilities.
- Description of systems and inclusion of available system schematic drawings and plans.
- A record of Risk Assessment.
- Details of system operation relevant to controlling the risk.
- The precautions to be implemented.
- System inspection and check procedures.
- All details of precautions carried out including checks, inspections, cleaning and disinfection.

The logbook documentation and operation should be audited on a periodic basis in order to ensure that the system conditions and precautionary procedures are being carried out satisfactorily.

The logbook should contain simple schematic diagrams of the domestic hot and cold water systems indicating the areas of storage and areas of distribution. This information may already be available in the building record drawing systems but for ease of reference simple line diagrams should be considered for the logbook.

The precise procedures relating to the precautionary measures i.e. cleaning of water tank systems and calorifiers, together with start up and shut down procedures for calorifiers should be maintained within the log book system and updated as required. The details of persons who are trained and competent to undertake the works should also be recorded in the log with details of the training undertaken. This also applies to specialist contractors who may undertake part of these duties.

The operating logbook document should state the details of the persons appointed as being responsible for the operational policy and management of precautions regarding control of Legionellosis on the site. The responsibilities should be clearly set out and lines of communication defined. Any specialist water treatment company providing a service on site and persons responsible for any auditing of the system operation and documentation should also be defined within the structure.

The present precautionary measures and maintenance activities should continue and the measures should be reviewed on an ongoing basis dependant on feedback on systems conditions and updated knowledge on the control of Legionella bacteria.

Consideration should be given to the inclusion of periodic water quality tests in order to monitor and record changes in local water conditions i.e. cold water from storage tanks, calorifiers and associated outlets.

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

The following observations and recommendation were made in the 2011 Risk Assessment Review.

Repair / replace the hot return circulation pump on the calorifiers within the Main Building.

This has not been carried out.

Drain and remove redundant calorifier, all associated hot and cold pipe work and fittings in Unit F Plant Room.

This has been carried out but one dead leg remains.

Fit scald warning sign near very hot outlets.

This has been carried out in some areas.

Flush any pontoon hoses as often as necessary to keep the cold water temperature to below the maximum temperature of 20°C as outlined in L8.

This has not been carried out.

Clean and disinfect all showerheads quarterly and record when carried out.

This has been carried out sporadically and was last carried out on 25/11/2013.

Ensure all domestic pipe work is adequately insulated to prevent heat gain / loss.

This has been carried out in some areas.

TMV to be serviced and maintained as per the manufacturer's recommendations.

This has not been carried out.

I would recommend bacteriological and legionella water samples be taken if temperatures fall outside the required limits (as is currently the case).

This has not been carried out.

Remove all dead leg pipe work or place on a weekly flushing regime and record in logbook when carried out.

This has been carried out in some areas.

Re-route the returning vent pipe to a foul drain via and air gap and cover the hole within the lid of the Main Building domestic cold water storage tank with a WRAS approved material.

This has not been carried out.

Perform a drop test to establish the correct capacity needed for Main Building domestic cold water storage tank.

This has not been carried out.

Fit screened overflow warning pipe to Main Building domestic cold water storage tank.

This has not been carried out.

Fit WRAS approved insulation to body and lid of Main Building domestic cold water storage tank.

This has not been carried out.

Fit screen to overflow pipe on Main Building domestic cold water storage tank.

This has not been carried out.

Fit screened vent to Main Building domestic cold water storage tank.

This has not been carried out.

Consider removal of Marina Office domestic cold water storage tanks and supply toilet flushing from the mains water services.

The tank above the staff toilets has now been removed.

Fit a sparge pipe to Marina Office domestic cold water storage tank above staff toilet to create cross flow of water or re plumb ball valve to opposite side of tank.

The tank above the staff toilets has now been removed.

Ensure insulation to all Marina Office domestic cold water storage tanks is fitted properly and securely.

This has been carried out.

Clean and disinfect all domestic cold water storage tanks and repeat annually if required.

This has not been carried out.

Continue temperature monitoring of the domestic cold water system and record in logbook.

This is being carried out.

Take water temperatures from all domestic cold water storage tanks on a six monthly basis and record within the logbook.

This has been carried out but only on two of the four tanks.

Inspect all domestic cold water storage tanks annually and clean and disinfect if required.

This has not been carried out.

Continue temperature monitoring of the domestic cold water system (including all sentinel outlets) and record within the logbook.

This is being carried out.

Ensure the Main Building calorifiers are adequately insulated.

This has not been carried out.

If access allows, visually inspect the calorifiers internally for scale and sludge on an annual basis.

This has not been carried out.

Fit temperature gauges to the flow (and return where fitted) pipe work on hot water calorifiers for monthly temperature monitoring.

This has been carried out in some areas.

Purge all calorifiers to drain annually and record when carried out.

This has not been carried out.

Ensure Main Building calorifiers are adjusted to store hot water at a minimum of **60°C** and return is a minimum of **50°C** or more at all times.

This has not been carried out.

SITE SURVEY

System Reference	Northney Marina
Location	MDL Buildings on Site
Method	Visual Assessment and Temperature Profiling

COLD WATER STORAGE

Cold water storage within the Marina Office block consists of three storage tanks located within the roof space of the building. Upon inspection of the two tanks located above the toilets they were found to be of plastic construction. Both tanks are fitted with lids and they are both fitted with screened vents. Both storage tanks are fitted with poly fibre jackets for insulation which are in good condition and fitted well.

Both storage tanks only had one outlet each these were fully opposed to the inlet therefore there was a good cross flow of water through both tanks.

There was found to be a light layer of sediment on the base and a light amount of biofilm on the base of both tanks, this could act as a nutrient for the proliferation of bacteria including legionella bacteria.

ACoP L8 recommends that cold water storage tanks be cleaned and disinfected on an annual basis if required. These storage tanks were last cleaned and disinfected in April 2009 and I would recommend that this be repeated within the near future. These storage tanks supply the toilet flushing in the ladies, gents and disabled toilets.

The temperature of the water within the storage tanks at the time of the survey was:

Left Tank	12.9°C	Satisfactory
Right Tank	9.2°C	Satisfactory

Upon inspection of the third cold water storage tank located in the roof space above the calorifiers this again was found to be of plastic construction. The storage tank was fitted with a lid this was also fitted with a screened vent. The inlet and outlet pipe work is fully opposed therefore there is a good cross flow of water through the tank. The tank is fitted with a poly fibre jacket for insulation which is in good condition and fitted well. The overflow pipe work is fitted with an insect screen.

There was found to be a light layer of sediment on the base and a light amount of biofilm on the base of this tank, this could act as a nutrient for the proliferation of bacteria including legionella bacteria.

ACoP L8 recommends that cold water storage tanks be cleaned and disinfected on an annual basis if required. This storage tank was last cleaned and disinfected in April 2009 and I would recommend that this be repeated within the near future. This tank serves the toilet flushing for the outside toilets.

The temperature of the water within the storage tank at the time of the survey was:

11.7°C Satisfactory

Cold water storage within the Main Building consists of one storage tank located within the roof space of the building.

The 2007 Risk Assessment made the following comments:-

The tank is of a GRP construction and there was no vent on the lid. There was no insulation on either the body or lid to prevent heat gain / loss. There is an overflow pipe fitted but it has no insect screen and therefore could allow the ingress of insects and other airborne bacteria. A vessel of this size should be fitted with an overflow warning pipe in addition to an overflow pipe, this was also missing. The cross flow of water was very good with the inlet pipe and outlet pipes being at opposing ends. There was found to be a light to medium layer of sediment on the base of this tank and a light to medium amount of biofilm on the sides, this could act as a nutrient for the proliferation of bacteria including legionella bacteria.

This tank has a returning vent pipe entering the lid of the tank. The vent should be re-routed to a foul drain via an air gap and the hole in the lid be covered by a WRAS (Water Regulations Advisory Scheme) approved material.

L8 recommends that cold water storage tanks be cleaned and chlorinated on an annual basis if required. It was not known when this storage tank was last cleaned and chlorinated. I would recommend this storage tank be scheduled in for cleaning and chlorination.

If it is correct that this tank only feeds the calorifiers then there is a possibility that it could be over capacity as many of the toilet areas etc. have local and point of use heaters that it is believed are mains fed. I would recommend that a drop test is carried out on this tank to ensure that it is of the correct capacity as over capacity can lead to stagnation.

On the 2011 and 2013 surveys it was found that all the above details remain unchanged. All previous reports stated that it is believed that two of the three outlet pipes supply the hot water calorifiers but the third pipe could not be traced and I would recommend that this is investigated further to ensure that it is not a dead leg. It is believed that all the other cold water outlets are mains fed.

On the 2013 survey the small pipe was traced as far as was practicable and is now believed to supply all the WC's and urinals within the Main Building.

The temperature of the water within the storage tank at the time of the survey was:

8.7°C Satisfactory

**Marina Office Roof Space
Above Toilets**

Internal view of the left domestic cold water storage tank.



**Marina Office Roof Space
Above Toilets**

Internal view of the right domestic cold water storage tank.



**Marina Office Roof Space
Above The Boiler Room**

Internal view of the domestic cold water storage tank.



Main Building Roof Space

Internal view of the domestic cold water storage tank.



HOT WATER STORAGE

Hot water storage within Northney Marina Office Block consists of two indirectly heated vertical calorifiers located in the plant room, the calorifiers are gas fired. The insulation for both calorifiers is rock wall fibre and is located beneath the outer metal casing. Both calorifiers can be cross connected to be linked in parallel but at present each calorifier is serving its own system on each side of the building. Both calorifiers are supplied directly from the mains water services via pressure reducers. There is a return system fitted with one circulating/return pump on each calorifier. There are temperature gauges fitted to the flow and return pipe work on both calorifiers for the monthly monitoring of water temperatures.

Both calorifiers are fitted with drain valves; these should be purged to drain on at least an annual basis and recorded when carried out. It is not thought that is being carried out.

If access allows, the calorifiers should be inspected internally for sludge and scale on an annual basis. It is not thought that is being carried out.

The left hand calorifier serves all hot water outlets within the gent's toilet/shower room and disabled toilet. The right hand calorifier serves the outlets in the ladies toilet/shower room, laundry, staff toilet and kitchen.

On the 2007 and 2011 surveys it was found the distribution pipe work from both calorifiers within the plant room had insulation that had come away in places this should be replaced.

The 2013 survey found that this has been carried out.

Both calorifiers have a water king electronic water softening device fitted to the return pipe work. There is also one fitted on the rising mains water that serves both calorifiers.

The temperature of the stored water within the calorifier at the time of the survey was:

Gents Calorifier Storage	74.3°C	Satisfactory
Gents Calorifier Return	66.6°C	Satisfactory
Ladies Calorifier Storage	74.8°C	Satisfactory
Ladies Calorifier Return	66.6°C	Satisfactory

ACoP L8 recommends hot water should be stored at a minimum of 60°C at all times and that return hot water should be a minimum of 50°C at all times.

Hot water storage within the Main Building consists of two vertical storage cylinder calorifiers located in Unit 005B. The calorifiers are heated by an internal coil that is heated by a gas fired boiler in the same room. The boiler also supplies the hot water to the heating radiators within the main building.

On the 2007 and 2011 survey it was found that the insulation for both calorifiers was rock wall fibre type jackets that were missing in places and badly fitted. This is still the case and the situation has since worsened and I would recommend that this is rectified as soon as is practicable.

The area around the calorifiers is used for storage and it is very difficult to gain access for inspection and therefore the pipe work could not be accurately traced. It is believed that both calorifiers are supplied from the cold water storage tank that is located in the roof space. Both calorifiers are fitted with drain valves; these should be purged to drain on at least a six monthly basis and recorded when carried out. It is not thought that is being carried out.

If access allows, the calorifiers should be inspected internally for sludge and scale on an annual basis. It is not thought that is being carried out.

There is a return system fitted with one circulating/return pump serving both calorifiers. This is not working and should be repaired / replaced as soon as is practicable.

On the 2007 and 2011 surveys it was found that there were no temperature gauges fitted to the flow and return pipe work on either calorifier system for the monthly monitoring of water temperatures. The 2013 survey found that this remains unchanged.

The temperature of the stored water within the calorifiers at the time of the survey was:

Left Hand Calorifier Storage	52.0°C	Not Satisfactory
Left Hand Calorifier Return	21.3°C	Not Satisfactory
Right Hand Calorifier Storage	54.3° C	Not Satisfactory
Right Hand Calorifier Return	21.3°C	Not Satisfactory

ACoP L8 recommends hot water should be stored at a minimum of 60°C at all times and that return hot water should be a minimum of 50°C at all times.

I would recommend that the calorifiers are adjusted to achieve this and that the faulty return circulation pump is repaired / replaced. This should all be carried out as soon as is practicable.

There are several electric local water heaters and point of use water heaters on site at Northney Marina. These should be adjusted, where necessary, to achieve 50°C at the outlet within one minute, as outlined in ACoP L8.

DOMESTIC WATER DISTRIBUTION

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.

Domestic hot water within Northney Marina Office Block distributes from two hot water calorifiers located in the plant room. The calorifiers each have their own system and serve all hot water outlets within the ladies and gents toilets / shower rooms, disabled toilet, laundry, staff toilets, kitchen and outside toilets.

Cold water down services within Northney Marina Office Block distributes from three cold water storage tanks all located within the roof spaces and serve all the toilet flushing in all toilet areas.

Mains cold water within Northney Marina Office Block rises in the plant room and serves both hot water calorifiers, cold water storage tanks, all cold water outlets within the ladies and gents toilets/shower rooms, disabled toilet, laundry, staff toilet, kitchen and outside toilets.

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.

Domestic hot water within Northney Marina Main Building distributes from two hot water calorifiers located in Unit 005B. It is believed that the calorifiers serve all hot water outlets within the main building except those that are fed by electric local water heaters and electric point of use water heaters.

It is now believed that cold water down services within Northney Marina Main Building also supply all the WC's and urinals as well as the calorifiers.

Mains cold water within Northney Marina Main Building rises in Unit 005B and it is believed to supply all the cold water outlets and the cold water storage (with the exception of the WC's and urinals).

Unit F is supplied by mains water from Unit F/G Plant Room which is located at the rear of Unit F.

In all areas of distribution and use, inspection, test and measurement was undertaken at representative positions in order to evaluate conditions and areas of potential risk.

At the time of the survey (within one minute) these hot water outlets within the building were recorded as follows:-

Northney Marina Office Block	
Laundry Sink	73.9°C Satisfactory
Kitchen Sink	71.4°C Satisfactory
Ladies Outside Toilet Wash Basin	72.6°C Satisfactory

Northney Marina Main Building	
Unit 005B Kitchen Sink	52.9°C Satisfactory
Unit 101-102 Kitchen Sink	Electric Local Water Heater No heater
Flat 7 Kitchen Sink	43.6°C Not Satisfactory
First Floor Gents Toilets Hand Basin	46.1°C Not Satisfactory

ACoP L8 recommends that the hot water should achieve 50°C, obtainable at user outlets within one minute of opening.

TMV's (Thermostatic Mixing Valves) are fitted to ensure that the water temperature at hot water outlets does not exceed 43°C and scald users (and ideally should not be less than 39°C).

The hot water supplying the TMV's should be 50°C at the TMV inlet as recommended in L8.

At the time of the survey (within two minutes) the cold water outlets within the building were as follows:

Northney Marina Office Block	
Laundry Sink	10.5°C Satisfactory
Kitchen Sink	10.8°C Satisfactory
Ladies Outside Toilet Wash Basin	8.8°C Satisfactory

Northney Marina Main Building	
Unit 005B Kitchen Sink	17.7°C Satisfactory
Unit 101-102 Kitchen Sink	9.9°C Satisfactory
Flat 7 Kitchen Sink	16.8°C Satisfactory
First Floor Gents Toilets Hand Basin	10.8°C Satisfactory

ACoP L8 recommends cold water should be stored and distributed at no more than 20°C.

GENERAL

- At the time of the 2011 Risk Assessment Review survey the water services logbook could not be found. On this 2013 survey I was shown a dedicated, ACoP L8 / BS8580 compliant, water services logbook that was in use.
- I was informed that the showers within the Marina office block are not used as frequently in the winter months as they are in the summer months. There are hand basins and W C's in Unit 107 and Unit 012 toilets that are never used as they are being used for storage. The WC and hand basin in Flat 3 are also never used and the sink in the cleaner's room on the ground floor appears to be infrequently used but could not be confirmed.

All infrequently used outlets create dead legs and should therefore be flushed on a weekly basis and recorded in a systems water logbook when carried out. I was informed that only the pontoons hoses and outside taps were on a weekly flushing regime.

- There are mains supplied hose reels around the pontoons in the Marina. Again the hose reels are not used as frequently in the winter months so again should be flushed on a weekly basis if not used.

The pontoons hose reels run along the pontoons and are uninsulated and I would expect the water temperature in the summer to exceed the recommended maximum of 20°C, as outlined in L8. I would recommend that temperature monitoring and flushing of the hoses is carried out as regularly as needed to keep the water temperature to below 20°C. I was informed that the pontoon hoses are flushed weekly only.

- Deadlegs are ideal areas for the proliferation of bacteria and should be removed or put on a weekly flushing regime (without creating an aerosol) and this be recorded in the logbook when carried out. Dead legs were found in the following areas:-
 - DL1 - Main Building - In Unit 105 there are two possible deadlegs from the floor near the door.
 - DL2 - Main Building - In the roof space above Room 101 there is a dead on one of the pipes that is connected to the domestic cold water storage tank.
 - DL3 - Unit F (Outside Block) - There is small dead leg on the cold water pipe. Note - the hot pipe is not connected to the water system.
 - DL4 - Marina Office Block Mess Room - There is a small dead leg on the cold water pipe under the sink.

- In the Outside Block Plant Room the mains pipe enters and feeds three other pipes. On previous surveys I have been informed that it is not known what they supply. On the 2013 survey I was informed that the two blue plastic hoses supply the outside taps in the boatyard and the copper pipe supplies the sinks in Unit F.

- TMV valves are fitted within the Marina Office block toilet /shower rooms, disabled toilet and staff toilet; these valves should be serviced and maintained. It is not known if this has been carried out.

- All showerheads should be cleaned/descaled and disinfected on a quarterly basis and recorded in a water system logbook. I would recommend showerheads be removed when flushing to prevent the creation of aerosols. It is not known if this has been carried out.

- There is no insulation on the inlet or outlet pipes on the Main Building cold water storage tank. There are some hot and cold temperatures that are out of the limits as outlined by L8. This is likely to be due to lack of insulation and I would recommend that all domestic hot and cold pipework be adequately insulated against heat loss / gain as soon as is practicable.
- I would assume the wash basin and the shower located within the disabled toilet are infrequently used if this is the case these should therefore be flushed on a weekly basis.
- Water temperatures from the domestic cold water storage tanks should be taken (remote from the inlet valve) on a six monthly basis and be recorded within the logbook. This is not being carried out.
- Monthly temperature monitoring of the calorifier flow and return pipework should be carried out and recorded. I was informed that this is not being carried out and recorded.
- Monthly temperature monitoring of the hot and cold outlets is being carried out and recorded. The water temperatures of **every** sentinel (the nearest and furthest from the supply) outlet must be taken monthly and recorded. Other representative basis should have temperatures taken on a monthly rotational basis so that over a period of 12 months all outlets will have been covered.
- The electric local water heater with Unit 101-102 is not working and this will render it a dead leg. It should be ensured that all electric local water heaters are working and achieve a minimum temperature of 50°C.

RECORDS

The logbook should contain a full management structure and written scheme detailing all of those involved with regard to control and prevention of Legionellosis from management through to the engineers carrying out the work.

Details of the responsibilities they hold should be included together with items listed as follows:

- Maintenance carried out on water systems.
- Cleaning and chlorination of water tanks.
- Inspection of water storage tanks.
- Monthly temperature monitoring.
- Flushing of infrequently used outlets (weekly).
- Annual inspections of calorifiers.
- Purging of calorifiers.
- Changing/cleaning of inline filters.
- Faults and defects to be recorded.
- Audit sheet for inspections of the logbook and dated when completed.

All of the above should be included in the water systems logbook and signed for when completed.

ADDITIONAL PHOTOGRAPHS**DL1****Main Building**

In Unit 105 there are two possible dead legs from the floor near the door.

**DL2****Main Building**

In the roof space above Room 101 there is a dead leg on one of the pipes that is connected to the domestic cold water storage tank.

**DL3****Unit F (Outside Block)**

There is small dead leg on the cold water pipe. Note - the hot pipe is not connected to the water system.



DL4

Marina Office Block

Mess Room

There is a small dead leg on the cold water pipe under the sink.



SUMMARY OF RECOMMENDATIONS

For ease of reference the actions and recommendations made throughout this report are summarised in this section. They should read in conjunction with the preceding observations section.

LEGIONELLA RISK CATEGORY KEY

1 = Insignificant risk.

2 = Controlled risk.

3 = Risk is controlled, but deteriorating conditions could increase risk.

4 = Potential hazards identified, but uncertain about risk.

5 = Risk Uncontrolled

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
<u>Hot Water Storage</u> <u>Northney Marina</u>	Ensure Main Building calorifiers are adjusted to store hot water at a minimum of 60°C and return is a minimum of 50°C or more at all times.	5		
	Purge all calorifiers to drain annually and record when carried out.	4		
	Fit temperature gauges where needed to the flow (and return where fitted) pipe work on hot water calorifiers for monthly temperature monitoring.	3		
	Continue monthly temperature monitoring of the flow and return temperatures on all calorifiers and record within the logbook.	5		
	If access allows, visually inspect the calorifiers internally for scale and sludge on an annual basis.	4		
	Ensure the Main Building calorifiers are adequately insulated.	4		

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
<u>Cold Water Storage</u> <u>Northney Marina</u>	Clean and disinfect all domestic cold water storage tanks and repeat annually if required.	5		
	Inspect all domestic cold water storage tanks annually and clean and disinfect if required.	4		
	Take water temperatures from all domestic cold water storage tanks on a six monthly basis and record within the logbook.	4		
	Fit screened vent to Main Building domestic cold water storage tank.	3		
	Fit screen to overflow pipe on Main Building domestic cold water storage tank.	3		
	Fit WRAS approved insulation to body and lid of Main Building domestic cold water storage tank.	3		
	Fit screened overflow warning pipe to Main Building domestic cold water storage tank.	3		
	Perform a drop test to establish the correct capacity needed for Main Building domestic cold water storage tank.	4		
	Re-route the returning vent pipe to a foul drain via and air gap and cover the hole within the lid of the Main Building domestic cold water storage tank with a WRAS approved material.	4		

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
<u>Distribution</u> <u>Northney Marina</u>	Weekly flushing of all low use infrequently used facilities showers, wash down hose reels etc. and record when carried out. Especially in winter months when facilities are not used.	5		
	Remove all dead leg pipe work or place on a weekly flushing regime and record in logbook when carried out.	5		
	I would recommend bacteriological and legionella water samples be taken if temperatures fall outside the required limits (as is currently the case).	5		
	TMV to be serviced and maintained as per the manufacturer's recommendations.	4		
	Ensure all domestic pipe work is adequately insulated to prevent heat gain / loss.	5		
	Clean and disinfect all showerheads quarterly and record when carried out.	3		
	Flush any pontoon hoses as often as necessary to keep the cold water temperature to below the maximum temperature of 20°C as outlined in L8.	5		
	Fit scald warning sign near very hot outlets.	3		
	Repair / replace the hot return circulation pump on the calorifiers within the Main Building as soon as is practicable.	5		

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
	Ensure that all on-site personnel who carry out Legionella management are competent and adequately trained in Legionella management.	5		
	I would recommend that all legionella management be recorded within the logbook.	4		
	<p>A Written Scheme should be prepared to ensure that all necessary controls are maintained, monitored and remain effective.</p> <p>BS8580 states – ‘Note - The Risk Assessment does not involve the preparation of the written scheme but rather provides information that is critical to the preparation’.</p>	5		