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## INTRODUCTION

<b>Client Address</b>	<b>Hampshire County Council PBRs Three Minsters House 76 High Street Winchester Hampshire SO23 8UL</b>
<b>Site Name</b>	<b>Willow Court NCU</b>
<b>Site Address</b>	<b>Willow Way Charlton Road Andover Hampshire SP10 3JY</b>
<b>Site contact</b>	<b>Jo Badby</b>
<b>Site telephone number</b>	<b>01264 325620</b>
<b>Last risk assessment carried out by</b>	<b>Freeston Water Treatment Limited</b>
<b>Date of risk assessment</b>	<b>May 2011</b>
<b>Date of previous review</b>	<b>N/A</b>
<b>Date of new review</b>	<b>28<sup>th</sup> March 2012</b>
<b>Review carried out by</b>	<b>Mr Chris Wilson</b>

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).

## 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The Assessment should be reviewed regularly (at least every two years) and whenever there is reason to suspect it is no longer valid.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.

## LOG BOOK

Is there a copy of the last Risk Assessment carried out on the domestic water system?	Yes	A copy of the original Risk Assessment was seen filed within the main office.
Is there a domestic water systems logbook in place?	Yes	A water systems log book is in place and was being used at the time of this Review; this was located within the main office.
Are the management structure duty holder, responsible person and deputies nominated in writing?	Yes	The Duty Holder and Responsible person have been nominated in writing but no Deputy Responsible Persons have been nominated.
Are contact details written in writing within the logbook documentation?	Yes	The contact details for the Duty Holder and Responsible person was seen written within the logbook documentation.

## MONITORING

Is hot water temperature monitoring being carried out on a monthly basis and results recorded within the logbook documentation?	Yes	Monthly temperature monitoring of the domestic hot water system is being carried out and recorded in the relevant section of the logbook.
Is cold water temperature monitoring being carried out on a monthly basis and results recorded within the logbook documentation?	Yes	Monthly temperature monitoring of the domestic cold water system is being carried out and recorded in the relevant section of the logbook.
Are hot water calorifier and hot water storage vessel flow temperatures being taken and results recorded within the logbook documentation?	Yes	Monthly temperature monitoring of the hot water calorifier flow is being carried out and recorded in the relevant section of the logbook but the hot water storage vessel flow temperatures are not.
Are hot water calorifier return temperatures being taken and results recorded within the logbook documentation?	Yes	Monthly temperature monitoring of the hot water calorifier return are being carried out and recorded in the relevant section of the logbook. Technically there is no return to the hot water storage vessel are therefore this does not need to be temperature monitored.
Are monitoring records recorded within the logbook documentation up to date?	Yes	Monitoring was up to date at the time of this Review.
Is weekly flushing of infrequently used outlets being carried out and recorded within the logbook documentation?	Yes	It should be ensured that all infrequently used outlets are flushed through at least on a weekly basis; record in logbook documentation when carried out.

## COLD WATER STORAGE

Have cold water storage tanks where fitted been cleaned and disinfected annually?	No	Only one tank is in service and this has been inspected annually and found not to need cleaning and disinfection.
Have storage tank cleaning and disinfection certification been filed within the logbook documentation?	No	No storage tank cleaning and disinfection certification was seen within the logbook documentation.
Storage tank cleaning and disinfection was last carried out on?		When the building was opened in 2005.
Are water storage tanks being inspected on a six monthly basis and temperatures recorded within the logbook documentation when carried out?	No	The cold water storage tanks should be inspected on a six monthly basis and temperatures from the tanks and remote from the ball valves be recorded within the logbook documentation.

## SHOWERS

Are showerheads being cleaned and descaled on a quarterly basis or as required?	Yes	All showerheads and hoses are being inspected / cleaned and descaled at least quarterly or as required.
Is it being recorded within the logbook documentation when showerheads are cleaned and descaled?	Yes	Showerheads are being inspected /cleaned and descaled and documented within the logbook documentation when carried out.
Is showerhead cleaning and descaling up to date?	Yes	Showerhead inspection / cleaning and descaling were up to date at the time of this Review.

## DRAWINGS

Are schematic drawings up to date with any changes made to the domestic water systems?	Yes	Schematic diagrams are filed within the Risk Assessment. It is thought that no changes have been made to the systems.
Are schematic drawings suitable and show all relevant storage and system details?	Yes	Schematic diagrams were seen to show relevant storage areas and system details. Copies should be filed within the logbook documentation.

## TMV's

Are TMV's where fitted being serviced and maintained?	No	It is not thought that this is being carried out. TMV's should be serviced and maintained as directed by the manufacturers.
Is documentation available to indicate when TMV's were last serviced / maintained?	No	TMV's should be serviced and maintained as directed by the manufacturers; and recorded within the logbook documentation when carried out. No Records were found within the logbook.

## SAMPLING

Has any Legionella or bacteriological water sampling been carried out on the domestic water systems?	No	Legionella water sampling should be carried out on the domestic water systems if the relevant water temperatures as recommended in the ACoP L8 and BS8580 are not constantly maintained.
Have Legionella or bacteriological water sampling test results if taken been filed within the logbook documentation?	No	Ensure all water sampling test results if taken are filed within the relevant section of the water systems logbook.

## REMEDIAL WORKS

Has any remedial works identified within previous Risk Assessments / Reviews been carried out?	Yes	Remedial works highlighted within the Risk Assessment have been carried out in some areas.
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## ANCILLARY EQUIPMENT

Is there any ancillary equipment on site?	Yes	Saffron Wing - wash up area-water softener Boiler Room - inline strainer on the inlet pipe to the cold water booster pumps. Boiler Room - inline filter on the outlet pipe of the cold water booster pumps. Sensory Room - two bubble tubes.
Is ancillary equipment being serviced and maintained to the manufacturer's recommendations?	Yes	Saffron Wing wash up area-water softener This may require servicing and disinfecting; this has not been carried out. I would recommend that the manufacturer is contacted for maintenance recommendations.  Boiler Room - inline strainer on the inlet pipe to the cold water booster pumps. It is unknown if this has been cleaned / disinfected. I would recommend that the manufacturer is contacted for maintenance recommendations.



		<p>Boiler Room - inline filter on the outlet pipe of the cold water booster pumps. It is unknown if this has been cleaned / replaced. I would recommend that the manufacturer is contacted for maintenance recommendations.</p> <p>Sensory Room - two bubble tubes. It is unknown if this has been cleaned / disinfected and is dosed with a biocide. I would recommend that the manufacturer is contacted for maintenance recommendations.</p>
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## HOT WATER STORAGE

Hot water storage at Willow Court - NCU is by one calorifier and one hot water storage vessel located within the Boiler Room. The calorifier was manufactured by Andrews Water Heaters and is supplied by the domestic cold water storage tanks within the loft via a pressure reducer, a water filter and booster pump set. The calorifier has insulation under the factory fitted metal outer casings, is of a stainless steel construction and is directly heated by gas.

The hot water storage vessel has insulation under the factory fitted metal outer casings, is of a steel construction and the manufacturer is unknown.

The calorifier supplies the storage vessel that in turn supplies all the hot water on site. There is an anti stratification pump that takes some of the hot water from the flow pipe of the storage vessel and returns it to the calorifier to be reheated. At the time of the Survey the anti-stratification pump appeared to be working correctly. ACoP L8 recommends that destratification / shunt pumps are operated automatically by a time clock and run for one hour every day before first use. I would recommend that this be carried out as it will become a dead leg if not used within a week. The return pipework from the building returns to the calorifier via a circulation pump which at the time of the survey also appeared to be working correctly.

The booster pump set has two pumps that appeared to switch automatically.

I would recommend that the calorifier and storage vessel be purged to drain to check the water quality on at least a six monthly period and recorded within a water systems logbook when carried out. I was informed that it is unknown if this is being carried out.

ACoP L8 recommends that calorifiers and storage vessel are checked internally for scale and sludge on an annual basis. I was informed that it is unknown if this is being carried out.

There are temperature gauges on the calorifier to show the storage and return temperature from the building. There are temperature gauges on the hot water storage vessel to show the storage temperature.

ACoP L8 recommends hot water storage to be a minimum of **60°C** and the return to be maintained at a minimum of **50°C** at all times.

**The temperature of the water at the time of the Survey was:-**

Calorifier	Storage	61.0°C	Satisfactory
Calorifier	Return	56.0°C	Satisfactory
Hot Water Storage Vessel	Storage	60.0°C	Satisfactory
Hot Water Storage Vessel	Return	No return fitted	

## **COLD WATER STORAGE**

Domestic cold water storage at Willow Court - NCU consists of two domestic cold water storage tanks located within the roof space above Rosemary Wing. There is also an underground water storage tank for the fire sprinkler system. As this is a 'closed system' it does not pose a legionella risk in normal operation and is therefore not covered by this survey.

The domestic cold water storage tanks are of a sectional, double skinned GRP construction and are in good condition. There are screened vents on the lids and screens on the overflow pipes and overflow warning pipes. The vessels have integral insulation to the body and lid but the lid hatch and inlet valve house lid are single skinned and not insulated, I would recommend that these be insulated if the stored water temperature becomes elevated to near 20°C in the hotter months.

There is a satisfactory cross flow of water through the tanks with the inlets and outlets being almost at opposing ends of the vessel, although tank no. 1 was empty at the time of the survey.

The inside of the tank no. 1 (nearest to the roof space access hatch) showed a very slight deposit of sediment on the base and had no evidence of biofilm on the sides. The inside of the tank no. 2 was empty and clean.

Sediment, corrosion and biofilm act as nutrients and an ideal environment for the proliferation of bacteria including Legionella.

I was informed that it is not thought that the vessels have been cleaned and disinfected since the building was opened but I would not consider it necessary to clean and disinfect them. Tank no. 2 should be cleaned and disinfected before being brought back into service.

It is suspected that all the cold water outlets and appliances on site (with the exception of the mains fed heating boilers pressurisation unit, the outside tap by the boiler room and the underground fire sprinkler tank) are supplied by the boosted cold water from the tanks but this requires further investigation to be confirmed.

The cold water storage temperature of domestic cold water storage tank no. 1 was:-

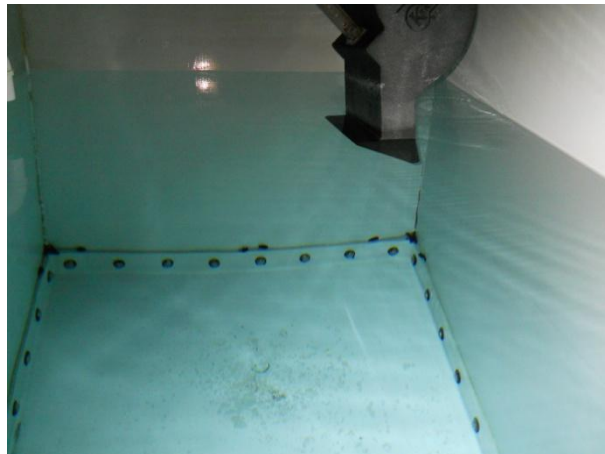
12.1°C          Satisfactory

The cold water storage temperature of domestic cold water storage tank no. 2 was:-

**EMPTY**

## COLD WATER STORAGE TANKS PHOTOGRAPHS

Internal view of cold water storage tank no. 1.



## ADDITIONAL PHOTOGRAPHS

### Boiler Room

The closed valve on the bypass pipe to the water filtration unit on the boosted cold water outlet pipe. This is creating dead legs either side of the valve.



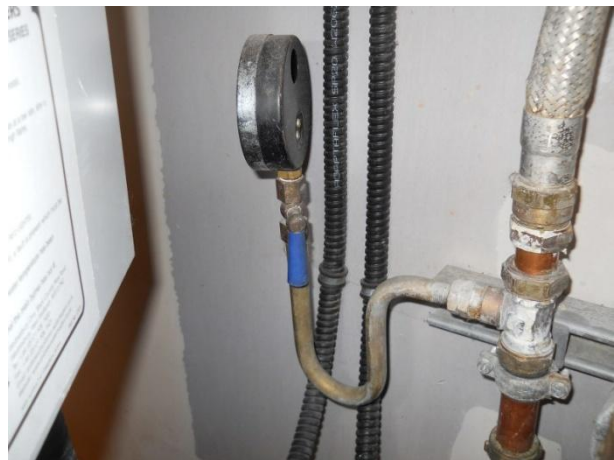
### Boiler Room

There is a dead leg on the outlet pipe of the cold water booster pump.



### Boiler Room

There is a swan neck type dead leg pipe to the pressure gauge on the return pipe of the building to the calorifier.



### Boiler Room

There is a swan neck type dead leg pipe to the pressure gauge on the return pipe of the storage vessel to the calorifier.



### Boiler Room

The pipe to the temperature gauge on the top of the return pipe from the building to the calorifier is too long and creating a dead leg.



### Boiler Room

There is a swan neck type dead leg pipe to the pressure gauge on the flow pipe of the calorifier to the storage vessel.





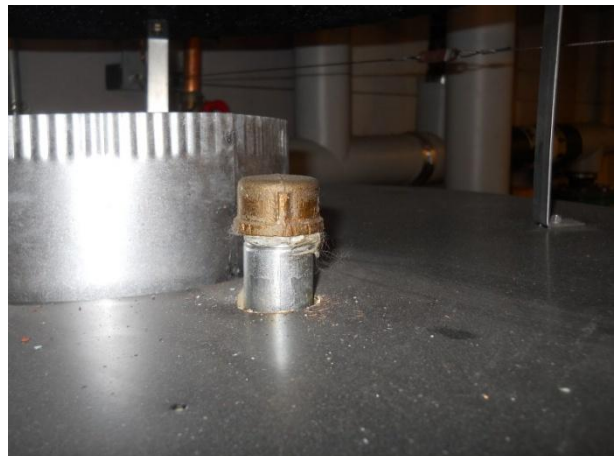
### Boiler Room

There is 500mm of pipe between the mains cold water header and the check valve on the supply pipe to the underground sprinkler tank. This is too long and creating a dead leg as the supply to the sprinkler tank is never flushed.



### Boiler Room

There is a small dead leg on the top of the calorifier.



### Boiler Room

The pipe to the temperature gauge on the top of the flow pipe of the hot water storage vessel is too long and creating a dead leg.



## SELECTED HOT & COLD WATER TEMPERATURES TAKEN AT REVIEW

Domestic water services should operate at temperatures that prevent the proliferation of Legionella. ACoP 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, obtainable at user outlets within two minutes of opening.

The temperature of mixed/ blended water from thermostatic mixing valves should be no more than 43°C to prevent scalding and ideally no less than 39 °C.

**The following hot and cold water temperatures were taken at selected outlets as follows:-**

Location	Hot °C	Cold °C	Mixed °C	Comments
Rosemary Wing Kitchenette Sink	56.9	13.0	42.3	Satisfactory
Jasmine Wing Kitchenette Sink	57.1	15.0	40.2	Satisfactory
Primrose Wing Room 55 Hand Basin	53.7	13.1	41.7	Satisfactory
Lavender Wing Kitchenette Sink	54.1	13.3	42.9	Satisfactory
Reception Area Staff Room Sink	58.8	12.9	41.7	Satisfactory
Reception Area Treatment Room Sink	52.0	13.0	41.6	Satisfactory
Acacia Wing Kitchenette Sink	53.7	13.0	46.0	Not Satisfactory
Juniper Wing Room 19 Hand Basin	57.1	13.5	40.4	Satisfactory
Saffron Wing Kitchenette Sink	50.2	15.0	42.6	Satisfactory

## RECOMMENDATIONS

- Dead leg pipework are ideal areas for the proliferation of bacteria and should be removed or put on a weekly flushing regime (without creating an aerosol) and recorded. Dead legs were found in the following areas:-
  - Boiler Room - There is a closed valve on the bypass pipe to the water filtration unit on the boosted cold water outlet pipe. This is creating dead legs either side of the valve
  - Boiler Room - There is a dead leg on outlet pipe of the cold water booster pump.
  - Boiler Room - There is a swan neck type dead leg pipe to the pressure gauge on the return pipe of the building to the calorifier.
  - Boiler Room - There is a swan neck type dead leg pipe to the pressure gauge on the return pipe of the storage vessel to the calorifier.
  - Boiler Room – The pipe to the temperature gauge on the flow pipe of the hot water storage vessel is too long and creating a dead leg.
  - Boiler Room – The pipe to the temperature gauge on the top of the return pipe from the building to the calorifier is too long and creating a dead leg.
  - Boiler Room - There is a swan neck type dead leg pipe to the pressure gauge on the flow pipe of the calorifier to the storage vessel.
  - Boiler Room – There is 500mm of pipe between the mains cold water header and the check valve on the supply pipe to the underground sprinkler tank. This is too long and creating a dead leg as the supply to the sprinkler tank is never flushed.

- Boiler Room – There is a small dead leg on the top of the calorifier.
- Roof space - The mains cold water isolation valve to domestic cold water storage tank no. 2 is closed creating a dead leg.
- Roof space - The outlet valve on the domestic cold water storage tank no. 2 is closed creating a dead leg of water from the outlet pipe of tank no. 1.
- If access allows, visually inspect the calorifier and hot water storage vessel internally for scale and sludge on an annual basis.
- Purge the calorifier and hot water storage vessel to drain on at least an annual basis and record when carried out.
- ACoP L8 recommends that destratification / shunt pumps are operated automatically by a time clock and run for one hour every day before first use. I would recommend that this be carried out as it will become a dead leg if not used within a week.
- Commence six monthly temperature monitoring of the cold water storage tanks and record results within the logbook.
- Fit extra insulation to the cold water storage tank inlet valve housing lids if needed in hotter months.
- Commence monthly temperature monitoring of inlet pipe to the TMV's (not just the blended water outlet) and record in the water systems logbook.
- There is an inline filter on the outlet of the cold water booster pump set in the boiler room. This should be cleaned / replaced in line with the manufacturer's recommendations. It is not thought that this is being carried out.

- There is a strainer on the inlet of the cold water booster pump set in the boiler room. This should be cleaned / disinfected in line with the manufacturer's recommendations. It is not thought that this is being carried out.
- The bubble tubes in the sensory room should be dosed with an appropriate and safe biocide, cleaned and maintained in line with manufacturer's recommendations. I was informed that it is not known if this is being carried out.
- Saffron wing wash up area-water softener - this may require servicing and disinfecting; this has not been carried out. I would recommend that the manufacturer is contacted for maintenance recommendations.
- I would recommend bacteriological and Legionella water samples be taken if the temperatures fall out of the recommended limits.
- Ensure Deputy Responsible Persons are appointed and are competent and adequately trained.
- Ensure the new maintenance operative on site is competent and adequately trained in Legionella management.

## SUMMARY

Since the Risk Assessment was carried out a new water systems logbook has been put in place for 2012.

A new maintenance operative has been appointed since the Risk Assessment and I would recommend that he be adequately trained in Legionella management as soon as is practicable.

Some remedial works have been carried out by Freeston Water Treatment Limited since the last Risk Assessment and this is an ongoing planned maintenance agreement between Freeston Water Treatment and Hampshire County Council.

Completed remedial work carried at Willow Court includes some dead leg removal.

The domestic cold water storage tanks were cleaned and disinfected in 2005 but only tank no. 1 is in service and does not need cleaning.

Legionella management including temperature monitoring of outlets and calorifiers; flushing of infrequently used outlets and showerhead and hose descaling is being carried out and recorded.

Monthly temperature monitoring of the hot flow pipe of the hot water storage vessel is not being carried out and should commence as soon as is practicable and be recorded when carried out.

The hot outlet temperatures are only being taken from the outlets and not on the inlet pipework to the TMVs. I was informed that this will be carried out and recorded within the logbook in future.

Six monthly domestic cold water storage tank temperature monitoring and annual purging and descaling of the calorifier and hot water storage vessel is not being carried out.