Method Statement for Microbiological and Chemical Sampling
Closed Loop Systems

This method statement has been prepared for Suppliers tendering for work that includes the Bacteriological and Chemical Sampling of Closed Loop Water Systems in accordance with BSRIA Water Treatment for Closed Heating and Cooling Systems (BG 50/2013).

This Method Statement deals only with the Technical Aspects of Sampling. It does not include any requirements for Health and Safety or access equipment/arrangements etc. Its use is limited to parity of tendering to ensure all tenderers are pricing for the same Bacteriological and Chemical sampling of Closed Loop Water systems Quality of Service. The tenderer must satisfy themselves that they have allowed for any other requirements beyond this Method Statement.

The paragraphs in the Method Statement are not necessarily in a sequential order.

All personnel involved with Bacteriological sampling of water systems must be fully conversant with water hygiene and trained in water sampling techniques. Evidence of such training will be required.

Tenderers to satisfy themselves that they fully understand the requirements of this method statement and price accordingly. Anything that is considered unclear or ambiguous etc should be raised with Engie prior to submitting or confirming a price.

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1 Microbiological and Sampling Generally:

1.1 All samples are to be recorded by the contractor, as prescribed within Annex G of BS 8554 Appendix A of this document.

1.2 Each sample bottle will be marked up with indelible marker pen.

1.3 A clean pair of disposable gloves are to be worn when taking each sample.

1.4 Hot and Cold water samples will be stored in a cooler bag containing a cool gel pack or some other mechanism of reducing the temperature to (5 ±3)°C during sample transport unless stated otherwise. Please note the following:

a. The hot and cold water samples will not be mixed; i.e. must be placed in designated Hot & Cold cooler boxes
b. The ice or gel pack must not come into direct contact with the sample bottle.
c.
   i. TVC's Pseudomonas Sulfate reducing bacteria (SRB) and Nitrite reducing bacteria (NRB) samples need to be brought down rapidly to (5 ±3)°C and therefore must be refrigerated. After taking these samples they must be placed in a gel or ice cooled cooler box and transported to either a refrigerated vehicle or a refrigerated cooler box capable of reducing the temperature to (5 ±3)°C. A data logger must be placed within the cooler box and stay with this batch of samples until delivered to the Lab. The sooner these samples are delivered to the Lab the better, but a maximum of 24 hours.
   ii. The sampler must supply the data logger ensuring it is included with the samples throughout their journey from placing the sample batch within the cooler box to their removal, and handover into the care of the Lab. The sampler must present the datalogger report along with the sample certificates from the Lab; including reference identification so the sample batch can be related to the datalogger.

1.5 All microbiological samples must be sent to a UKAS accredited laboratory that is well versed with the testing requirements within BS8552. Dip slides and microbiological test kits must not be used in isolation, they may be used to supplement laboratory testing; but only via consent with Engie staff.

1.6 Chemical Sampling field test kits can continue to be used where this has been established by a history of sample results confirming correct parameters have been recorded. New systems or systems where existing records show parameters to be erratic. Samples should be set via laboratory testing to establish a baseline for the future use of field test kits

1.7 Samples should not be taken from chemical dosing pots as there is a risk that residual chemical in the pots could affect the result.

1.8 The sample should normally be taken in "forward flow". If the sampling point is between a terminal unit control valve and the terminal unit itself, then it might be necessary to manually open the control valve or commissioning valve and close the return leg isolation valve to avoid backflow.

2 Microbiological Sampling from a closed loop system

2.1 Samples of system water for microbiological analysis can be taken from dedicated sampling points, drain valves or binder points.

2.2 Drain cocks conforming to BS 2879 should not be used as general-purpose sampling points as they are not suitable for this. Where no suitable sampling points exist in the functional design of the system, dedicated sampling points of not less than 15 mm nominal bore should be installed in accordance with Annex A of BS 8552.

2.3 Wherever possible microbiological water samples should be taken from dedicated sample points.

2.4 If chemical and microbiological samples are being taken from the same point; ensure the microbiological samples are taken first.

2.5 The "initial water" from a valve will often contain bacteria which may have found conditions suitable for growth within the small "dead leg" that exists above the sample point valve.

2.6 If this were to be taken for analysis the results could be wildly inaccurate and lead to an incorrect impression of the systems condition.

2.7 If using a binder point and tube, the needle and tube should be disinfected before use by flushing the inside, and spraying the outside, with 1,000mg/L of Sodium Hypochlorite. There is not usually any system dead leg but the binder probe should be inserted, and the sample tube briefly flushed to remove any residual disinfectant before collecting the sample as described below.

2.8 Samples should not be taken through a hose or non-sterile conduit.

2.9 The sampling point must first be disinfected; using the 'swan neck' wash bottle drench the inside of the sampling point with 1,000mg/L of Sodium Hypochlorite. The outside of the sample point should be wiped with an alcohol wipe to remove debris or contamination and then sprayed with 1,000mg/L of Sodium Hypochlorite. Leave for two minutes to allow the disinfection process to take place. If the sample point is in a very poor condition i.e. obvious scale and or debris observed, remove the scale with an appropriate scale remover, drench the inside of the sample point a second time; wipe the outside again with alcohol wipe allowing 2 minutes for the disinfectant to work. Fully open the sample point, discharge sufficient volume of water to flush the dead leg. If possible, take the sample without closing the sample point. The cap should be taken from the bottle, without putting the cap down, ensuring no fingers touch the thread of the bottle or the inside of the cap; hold the cap inside face down to ensure no debris is caught within the cap and fill the bottle to the top, without leaving an air gap. If it is not possible to leave the sample point running while the cap is removed; then the sample point should be isolated and reopened once the sample bottle is prepared.

3 Closed System Chemical Sampling :

3.1 Drain cocks conforming to BS 2879 should not be used as general purpose sampling points as they are not suitable for this. Where no suitable sampling points exist in the functional design of the system, dedicated sampling points of not less than 15 mm nominal bore should be installed in accordance with Annex A of BS 8552.

3.2 The "first catch" sample from a drain valve will often contain suspended solids which have settled out in the small "dead leg" that exists above the drain valve.

3.3 If this were to be submitted for analysis the results could be wildly inaccurate and lead to an incorrect impression of the systems condition.

3.4 Fully open the sample point, discharge sufficient volume of water to flush the dead leg. If possible, take the sample without closing the sample point. The cap should be taken from the bottle, without putting the cap down, ensuring no fingers touch the thread of the bottle or the inside of the cap; hold the cap inside face down to ensure no debris is caught within the cap and fill the bottle to the top, without leaving an air gap. If it is not possible to leave the sample point running while the cap is removed; then the sample point should be isolated and reopened once the sample bottle is prepared.

Close the sample point and ensure isolation.

4 Closed System Sampling from a Sample Cooler:

4.1 It is important to ensure that the water isolation valve to the cooler is open before sampling.

4.2 Next open the sampling valve to the system carefully and only allow low flow through the cooler to ensure adequate cooling.

4.3 As with all sample coolers discard the first sufficient volume of water to clear any dead leg from the sample cooler of system water before taking the sample.

The sample bottle should be filled completely without leaving any air gap.

Ensure the sample point is isolated and the water supply to the water cooler.

Appendix A – Example Log for avoidance of deviating samples

Annex G
(informative)

Example documents used to avoid deviating samples

Figure G.1 Example log