

**Bundle of documents for Oral hearings
commencing from 19 August 2024 in relation
to the Queen Elizabeth University Hospital
and the Royal Hospital for Children, Glasgow**

**Bundle 21 – Substantive Core Participants
responses to Dr Walker Report
Volume 2**

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SCOTTISH HOSPITALS INQUIRY

GLASGOW 3

ADDITIONAL QUESTIONS TO BE ADDRESSED BY EXPERT WITNESS DR J
WALKER

SUBMISSION ON BEHALF OF THE CUDDIHY AND MACKAY CORE
PARTICIPANTS

1. We have noted Dr Walker's comment at para 2.1.8:

"2.1.8. The lack of timely and effective management of the water system, e.g. not rectifying high risk issues (requiring remedial action as soon as possible by senior management) identified in the DMA 2015 risk assessment resulted in unsafe water and waste systems. Patients were therefore at an increased risk of infection and exposed to a range of water borne pathogens."

Whilst the expert report details events from the point of occupancy in 2015 until 2023, the expert witness does reflect on some events pre occupancy. He states that there were high risk issues identified in the 2015 Report by DMA Canyon. We request that this Expert is asked to comment on known issues and risks that existed pre-2015 both in respect of the Glasgow Hospitals development and elsewhere. Our justification for making this request is:

a) Dr Walker makes reference to pre-2015 events, most notably around the selection of Horne Optithern Taps and recommendations made in 2012.

b) Dr Walker has unique knowledge and insight into the issues surrounding Optithern Taps that were installed in the RHC. This is due to concerns around risk from *pseudomonas aeruginosa*, following learning from the Neonatal hospital in Northern

Ireland in 2011/2012. This witness was involved in the subsequent review of the NI incident and subsequently co-authored a paper in 2014 relative to findings.

c) Following invitation, he attended a meeting in June 2014 where stakeholders engaged in construction of QEUH/RHC debated the selection of the Horne Optithern taps. Indeed, both NHSGGC and Currie Brown refer to his attendance in their respective responses to Glasgow 2 closing statement. A critical outcome of that June 2014 meeting was the decision to transfer the risks associated with the Horn Taps from Currie Brown to NHS GGC. This transfer required a risk mitigation strategy that stipulated that a pre-planned maintenance strategy should be created whereby those taps would be subject to maintenance every three months. This witness should be asked to comment on the risk mitigation strategy that was discussed and understood by him to have been agreed. This strategy is reflected in the QEUH draft written scheme 'taps should be serviced quarterly including cleaning and disinfection of strainers', however, as evidence in this report has shown, those taps were never subject to such maintenance and were found to be microbiologically contaminated.

d) Although Dr Walker states that other experts have been instructed to consider pre-2015 issues, this witness offers a unique insight to the key issues outlined above.

2. We invite the Inquiry to ask this expert witness to comment on the following as having a material bearing on the decision by NHSGGC to install, retain and maintain Horne Optithern taps as part of the water and waste water system:

On 12 December 2011 the Western Health and Social Care Trust (Western Trust) declared an outbreak of **Pseudomonas aeruginosa** at the neonatal unit at Altnagelvin Hospital, Londonderry, after three babies were confirmed to be infected. One baby had tragically died and a second baby had been transferred to the regional neonatal unit in the Royal Jubilee Maternity Service (RJMS). The third baby continued to be cared for in Altnagelvin at that time.

On 17 January 2012 the Belfast Health and Social Care Trust (Belfast Trust) declared an outbreak of **Pseudomonas aeruginosa** in the RJMS regional neonatal unit. At that time two babies who had been confirmed as having the infection had tragically died

and another baby was known to have been infected. A third baby sadly died after the outbreak was declared.

Subsequently information became available through typing of strains of **pseudomonas** that one of the babies who had died in Belfast had a strain of **pseudomonas** which has been linked to Craigavon neonatal unit. It was also found that a baby, who had been diagnosed with **pseudomonas** at Craigavon Hospital in December 2011, had the strain of **pseudomonas** which caused the outbreak in Belfast. This baby sadly died in January 2012. **Pseudomonas** was not the reported cause of death.

During the period from 17 to 31 January 2012, screening of babies in units across Northern Ireland confirmed that there were babies in other units who had been colonised with pseudomonas on their skin.

On 30 January 2012, Mr Edwin Poots, the Minister for Health, Social Services and Public Safety, asked The Regulation and Quality Improvement Authority (RQIA) to facilitate the establishment of an independent review into the circumstances leading to the incidents and the effectiveness of the response.

An interim report was submitted to the Minister on 30 March 2012 and published on 4 April 2012, with a final report being published on 31 May 2012. Suffice it to say that the incident and subsequent findings and recommendations influenced guidance throughout the United Kingdom and indeed Scotland.

On 07 February 2012, the then Chief Medical Officer, Sir Harry Burns and Derek Feeley, Director General, jointly sent a letter to numerous individuals across NHS Scotland, including all Board Chief Executives, Directors of Estates and Facilities, Health Protection Scotland and Health Facilities Scotland, Infection Control Managers and HAI Executive leads, titled, 'Water Sources and potential infection risk to patients in high-risk units.' The purpose of the letter was to remind everyone of the potential infection risks posed by water systems in healthcare facilities and to clarify actions required. This letter was a follow up to Health Facilities Scotland (HFS) email of 25 January 2011 "*water sources and potential for infection from TAPS and sinks*" and

communication to Infection Prevention and Control Teams (IPCT's) of January 2012 "*SBAR on Pseudomonas and Water.*"

On 03 May 2013 a further letter CEL 08 (2013), again from Sir Harry Burns and Derek Feeley, referenced matters alluded to in the background section above. Recipients were directed towards revised parts A and B of Scottish Health Technical Memorandum 04-01: Water safety for healthcare premises (SHTM-04-1) as well as National Services Scotland Guidance for (NNU's), adult and paediatric intensive care units in Scotland to minimise the risk of pseudomonas aeruginosa infection from water. The authors thereafter provided instruction that NHS Boards must ensure that: -

- **all high-risk units where patients may be at increased risk of pseudomonas** and related infections are identified and control measures applied.
- best practice relating to the use of hand washing facilities is consistently and fully applied.
- **all taps in all clinical areas in high-risk units** (manually or automatically) are flushed daily (and a record kept) to minimise the risk of pseudomonal contamination. Flushing should be for a period of **one minute**, first thing in the morning, at the maximum flow rate that does not give rise to any splashing beyond the basin.
- domestic staff have been trained in the correct decontamination procedures for sinks, basins and taps in ICUs and neonatal units to minimise the risk of pseudomonas.
- **they have established a system of clear governance with accountability to the appropriate Executive Director.**
- they are compliant with revised SHTM-04-01.

It is the case that in March 2014 concerns were raised as to the matters alluded to in the expert report, specifically the installation of Horne Optitherm taps across the QEUH/RHC estate, resulting in discussions between a variety of stakeholders, including NHSGGC, Currie & Brown, one of the main contractors and National Services Scotland, which govern relevant entities such as Health Protection Scotland (HPS) and Health Facilities Scotland (HFS) (NSS). It is this meeting, held in June 2014, that the expert witness attended and therefore can 'speak' to such.

3. We invite the Inquiry to explore pre and post 2015 water and waste system operation and monitoring through sampling and to ask Dr Walker to comment on the following issues related to pre-2015 sampling, analysis and detection of bacteria.

a) Section 6.10.3 of the expert report states ‘A complete lack of sampling for Legionella means that there is a complete lack of knowledge as to the risk of Legionella to the vulnerable patients in the hospital – monitoring can indicate whether you are achieving control and sampling for Legionella is a means of checking the system is under control (HSE ACOP page 5 para 2c). In addition, section 6.27 describes M. Chelonae HAI where the hypothesis was that patients had been exposed to unfiltered water sources in the hospital indicating that filters are not a panacea when the underlying problem is waterborne pathogens present in the water system”

b) A 2014 email communication between Dr Inkster and Estates and Facilities, sought to clarify who was responsible for the sampling regime. It was established that this was the responsibility of Estates and Facilities. However, from 2015, considerable attempts were made by Microbiologists to access sampling results in order that they could fulfil their role in establishing emerging risks to patients. Despite repeated requests, results were never provided and despite recommendations made in the March 2021 Case Note Review Report by Professor Mike Stevens, they were still not shared. This resulted in letters from Professor Stevens to the CEO of NHS GGC and the then Cabinet Secretary for Health and Social Care. This sequence of events is vital in understanding the manner in which the system was operated. The PI is invited to request access to the ‘South Water Safety Group’ minutes pre occupancy in 2015. Dr Christine Peters was the Chair of this group and, in that capacity, repeatedly asked for those results to be provided.

We submit that this information is critical to understanding the culture that prevailed relative to sampling, analysis and identification of bacteria. This witness should be asked to consider and comment on the sampling, analysis and identification of bacteria pre-2015 and specific instruction delivered to NHSGGC in 2013 under CEL8 2013, namely-

'It is the intention that the Board Water Safety Group will provide an assurance annually to the NHS Board on compliance with the requirement of this CEL through the Board's annual Controls Assurance process. Accordingly, NHS Boards should report annually confirming compliance or, where compliance has not been met, a plan and timescale for achieving compliance.'

If the local Water Safety Groups were not being provided with the information required, how could they adequately report to the Board Water Safety Group and therefore comply with the requirements of the instruction.

4. We invite the PI to consider the report "Summary of Incident and Findings of the NHS Greater Glasgow and Clyde: Queen Elizabeth University Hospital/Royal Hospital for Children water contamination incident and recommendations for NHS Scotland" (published 22nd February 2019 at:-

<https://www.gov.scot/binaries/content/documents/govscot/publications/factsheet/2019/02/qe-university-hospital-royal-hospital-children-water-incident/documents/queen-elizabeth-university-hospital-royal-hospital-for-children-water-contamination-incident-hps-report/queen-elizabeth-university-hospital-royal-hospital-for-children-water-contamination-incident-hps-report/govscot%3Adocument>).

This Report is referenced as a source in Dr Walker's Report. Reference is made in this document to ***"Specific microorganisms which can be tested for include: Coliforms, Escherichia coli (including O157), Pseudomonas aeruginosa, Salmonella spp, Campylobacter spp and Environmental Mycobacteria. Testing for these is not conducted as standard within current guidance and typically occurs in response to a suspected or confirmed outbreak, or due to identification of a series of sequential cases."***

We ask that this Expert be invited to comment on whether the testing system was in accordance with the above. Indeed, Mycobacteria Chelonae (MC) had been positively identified in a patient in June 2018 and then again in October 2018 but neither episode was ever reflected in any formal reporting to the Board. And whilst the above states that testing for MC is not standard, it typically occurs in response to a suspected or confirmed outbreak. Water sampling and water testing was never carried out at the times of these episodes, which by GGC own admission was an occurrence of a rare pathogen not previously observed in GGC over the last 10 years, save for four

instances, all in adults. Indeed, MC was considered so rare, it was not contained within the National Register of bacteria. (We note that Mr McIntosh KC has indicated to Ms Connelly that the issue of the recorded instances of MC is contested).

In addition, when one considers NHS GGC Water System Safety Policy: Written Scheme and Operational Procedures at that time, the report states when water samples should be taken, namely: -

“Samples should be taken from key areas where it is known that patient groups are most vulnerable as defined by the Board Water Safety Group and a collection regime will include samples from these areas along with any additional areas on the site considered by the group to have increased levels of risk. A list of the areas for each site will be produced and made available on the intranet for reference. The Board will adopt as a rule of thumb an approach that where water sampling occurs as a result of increased TVC’s where there have been three clear samples the sampling regime will cease. This will be reviewed and agreed by the Board Water Safety Group.”

It is therefore important for the PI to consider the above as further evidence of the manner in which GGC operated. If no samples were taken, how can the Board Water Safety Group enhance their understanding of the potential risks to patients. How can bacterial infection of a patient be compared to the environment, if no samples are being taken?

5. Evidence of Microbial Contamination

The expert report makes reference to various bacteria and fungal infections, most notably Gram-Negative Bacteria. This witness should be asked to comment on the absence of testing date for Gram Positive Bacteria (GPB). Indeed, the expert witness makes specific reference to microbiological testing which one would consider leads to information as to whether there is microbial contamination. This expert should be asked to comment on the impact of IPC management by Water Safety Groups when incomplete testing is carried out. We are not suggesting that routine testing should be carried out for every pathogen, no matter how rare but we submit that there is evidence before the Inquiry that indicates failures when rare pathogens are identified as having been contracted by patients.

The PI are invited to reflect on the March 2021 Case Note Review Report and more specifically the confidential reports in respect “Molly Cuddihy” that were provided to the PI.

The CNR provides evidence of Microbial Contamination that is NOT referenced in this expert report. The CNR report states that in 2016, within the pediatric oncology ward 2A of QEUH/RHC, there was an instance where a patient contracted Mycobacteria Chelonae. This episode is not referenced in documents supplied by GGC and in consequence, there is no accessible information as to actions taken to manage or communicate the extent of water contamination. Neither has this information been made available to the expert witness for him to consider and offer expert opinion. It is important to note that the CNR confirm that there were NO water sampling tests at any point during 2015, 2016 or 2017 relative to Mycobacteria Chelonae, which as previously mentioned is at odds with guidance in this regard.

The CNR report states another rare Mycobacterium (not chelonae) was detected in a water sample in 2018 but there is no identification that this sample or any other sample was taken to look for mycobacterium in general or mycobacterium chelonae in particular. Again, the witness makes no reference to this in his report and therefore one can only assume he has not been provided with this.

The CNR report further provides that in 2019, samples taken on 14.4.19 identified the presence of Mycobacterium Chelonae at four sites in Ward 2A. Three of these sites were identified as the showers in rooms 6, 16 and 17 but the location of the fourth sample within the ward is not clearly described. This information is significant not only in terms of the presence of Mycobacterium Chelonae, but also identifies it within ward 2A; in showers and other areas. It is critical to note that the patient who contracted Mycobacterium Chelonae in 2018, occupied two of those rooms. It should also be noted that due to the manner in which GGC operated or failed to operate a system of water testing, no water samples were taken in 2018 which raises the obvious question that had water testing been carried out at the time, pathogens may have been found at that point.

It is important, in the context of the parameters set by the expert, that the CNR concludes by asking “was enough investigation, implementation of control measures and risk management considered in order to prevent further outbreak?” The CNR confirms that they found no evidence of a specific organisational response to Molly Cuddihy’s infection nor, as indicated above, any evidence of water testing.

In all the circumstances it is suggested that the above provides evidence that has not been considered by the expert witness and indeed, as is not referenced in the Appendix provided at section 11, the witness has not provided expert opinion in this regard.

This point is something that I have made consistently and is supported by this witness, where there is a lack of sampling, there is a lack of knowledge as to the risks. In addition, where there is a lack of information, the water safety group and others are deprived of an opportunity to analyse and assess and therefore provide intelligence as to those potential risks associated with contaminated water.

Clare Connelly, Advocate
Glasgow 10th June 2024

Scottish Hospitals Inquiry

NHS National Services Scotland response to the report by Dr J.T. Walker ('Review of the NHS Greater Glasgow and Clyde: Queen Elizabeth University Hospital/Royal Hospital for Children water and waste-water system from the point at which patients occupied the site in 2015')

1. In this short Response, NHS National Services Scotland ("NSS") responds to the report submitted by Dr Walker on 21 January 2024. NSS will be happy to provide further input and clarification as required. The comments made do not seek to raise new issues not covered in the expert report, but rather comment on one document referred to within the report and suggest clarification of other others.
2. Dr Walker's report refers to a report cited as "I Storrar and A Rankin, 'Report on the Findings of the NHS GGC: QEUH/RHC Water Contamination Incident and Recommendations for NHS Scotland 2018'". This report is first referenced in paragraph 3.1.2 at footnote 48, and is then cited in a number of subsequent footnotes. The report is listed in the Bibliography at 8.4, but not produced in Bundle 18 (Documents referred to in his expert report). NSS notes that this report is produced in Bundle 19 at item 21. NSS's position is that this report is only a draft which was never finalised. Dr Walker in his report does not make clear that this is a draft report only. Given that it is only a draft report, Dr Walker and other experts should not refer to and rely on what is stated in it. NSS points out that this report is clearly watermarked as DRAFT. The draft report was shared with NHS GGC for factual accuracy on 6 August 2018. Substantial draft comments on the draft report were received from NHS GGC on 10 August 2018. Although it had been intended to finalise the draft report and to submit it to the Scottish Government on 17 August 2018, that did not in fact happen. After NSS's receipt of comments from NHS GGC on 10 August 2018, the draft report was not finalised, as the decision was taken for two separate reports to be prepared instead, one by Health Protection Scotland ("HPS") and another by Health Facilities Scotland ("HFS"). On 17 August 2018, NSS advised NHS GGC that the report was not being submitted to the Scottish Government. NSS provided the Scottish Government with a SBAR dated 17

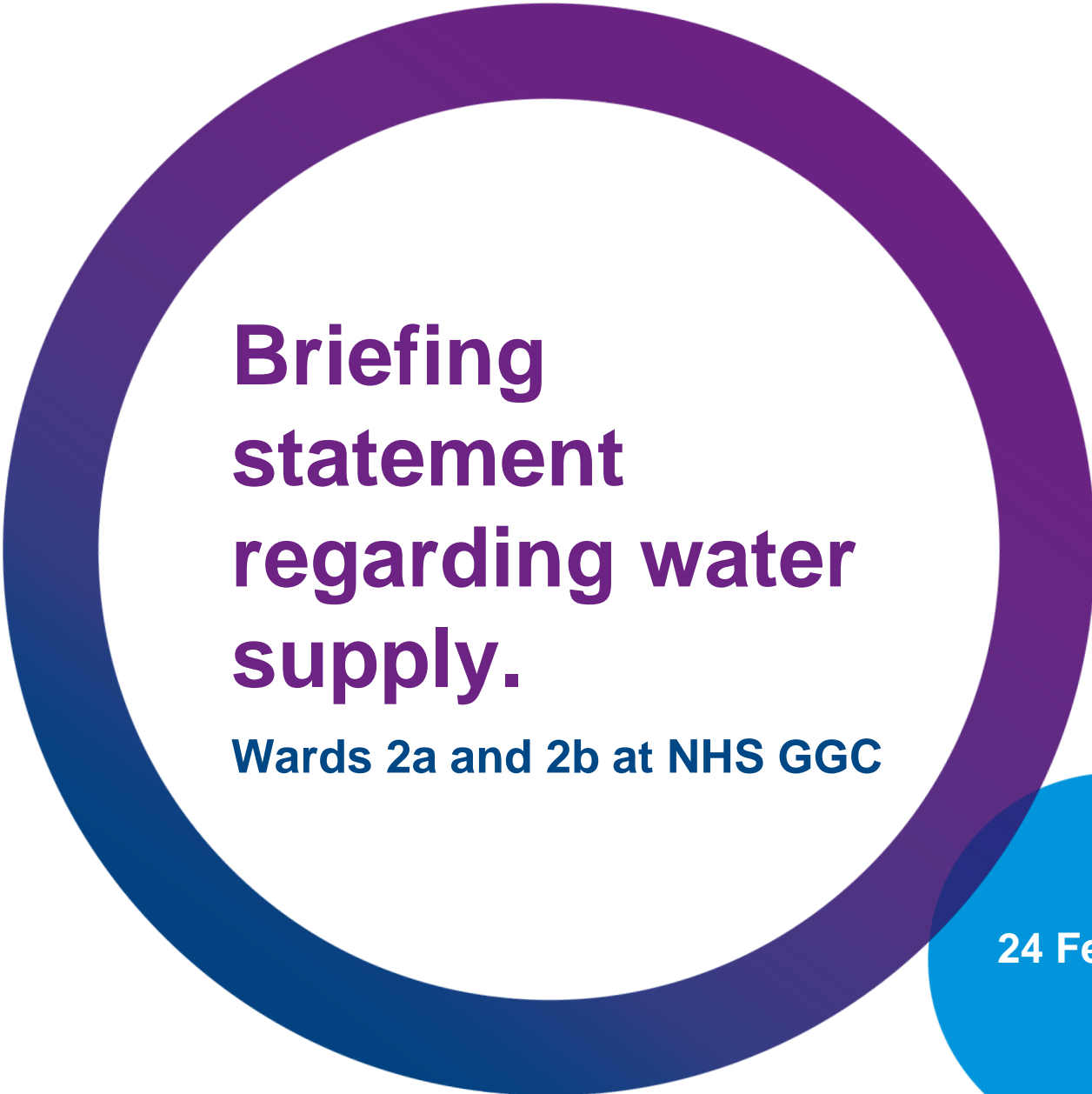
August 2018 on the water contamination incident (SBAR in Bundle 3, item 12). To the best of its knowledge, NSS did not submit the report to the Scottish Government.

3. In his Bibliography, Dr Walker also lists the HPS Summary of Incident and Findings of the NHS Greater Glasgow and Clyde Queen Elizabeth University Hospital/ Royal Hospital for Children contamination incident and recommendations for NHS Scotland dated 20 December 2018 (at 8.3). He produces this HPS Summary in Bundle 18 (Documents referred to in his expert report) at item 11. However, he does not refer to or produce another HPS report which is contained in Bundle 7 at item 1: HPS Initial report on the findings of the NHS Greater Glasgow and Clyde: Queen Elizabeth University Hospital/ Royal Hospital for Children water contamination incident and recommendations for NHS Scotland, dated 31 May 2018. He refers briefly to but does not produce a report prepared by HFS which is contained in Bundle 7 at item 4: Water Management Issues Technical Review, HFS March 2019 (referenced at paragraphs 7.11.23, footnote 548). As noted above, NSS considers that it is inappropriate for Dr Walker to rely on a draft report, particularly when there are two finalised HPS reports and a finalised HFS report.
4. At paragraph 5.24, Dr Walker describes waste-water drains. He states “In hand wash basins/ sinks the drain encompasses the connection of a pipe onto the basin/sink that connects to a trap and or u-bend. The purpose of the u-bend is to hold water to prevent sewer gases from entering the home.” NSS observes that u-bends were not used at Queen Elizabeth University Hospital/ Royal Hospital for Children.
5. At paragraph 6.3.16 Dr Walker states that “the dump valves were not operational, “i.e. not connected to the BMS”. NSS notes that dump valves do not necessarily need to be connected to the BMS to be operational. For example, local sensors or time operated valves can be used. NSS makes this comment for technical completeness only.
6. With regards to Dr Walker’s report at section 7, the involvement of NHSScotland Assure (“NHSS Assure”) has been limited. NHSS Assure was asked to support the return of patients to wards 2a and 2b, following a refurbishment, in February 2022. NHSS Assure provided a Briefing statement regarding water supply, wards 2a and 2b,

dated 24 February 2022. No further support from NHSS Assure regarding water sampling or results has been requested.

National Services Scotland

11 June 2024



Briefing statement regarding water supply.

Wards 2a and 2b at NHS GGC



24 Feb 2022

Assurance

Following on from the meeting between NSS and NHS GGC, SG and CNO on 17th Feb 2022.

We (NHS S Assure) worked together with staff from NHS GGC. We provided a document that detailed the questions we had from the information supplied to us regarding the safety of the water supply in Wards 2A and 2B.

They (NHS GGC) endeavoured to collate and supply information to us quickly so that we would be able to provide assurance on the reoccupation of the Wards 2A and 2B. This was provided securely through a TEAMS channel

We all agreed that we would use the same methodology that we use for KSAR assurance projects:

- NHS GGC provide us with initial tranche of information (11th Feb)
- NHS S Assure review and respond to information provided and provide additional requests for information (17th Feb)
- GGC provided additional information (22,23rd Feb)
- NHS S Assure reviewed and worked with GGC to allow them to produce an action plan that is held, monitored and actioned by NHSGGC
- Assurance is given by NHS S Assure that we are satisfied that all risks and issues are mitigated by inclusion on the action plan

Information was supplied to us on 22/23rd Feb and we have responded with recommendations for inclusion in an action plan to be monitored and completed by NHSGGC.

NHS S Assure have several recommendations for action prior to opening wards 2A and 2B, they are listed below

- Legionella assessment including completion of resultant action plan
- Pseudomonas assessment including completion of resultant action plan
- Subordinate loop monitoring and recording as detailed in HSG274 must be undertaken including consideration of remote monitoring and documented before occupation
- An SOP for reporting, managing and investigating filter failure (pseudo-failure or otherwise) must be completed before occupation
- A document on locally agreed levels has been developed by NHSGGC. This must be approved by the IPCT, and the BICC and WSG before occupation. The IPCT must agree and monitor the level of water quality for patient use/access acceptable for this patient population before occupation.
- Pre flush samples and results must be obtained before occupation
- Details of communication and management of an abnormal water result are required to be available for NHSGGC. This should be in place before occupation and should include whose responsibility is it to communicate/escalate and to whom: in the event of a clinical case: when a PAG/IMT is held and confirmation that a HIAT assessment will be undertaken

We have discussed these with the NHSGGC team this afternoon (24th) and have been assured that they have most of these highlighted issues already in train and all will be completed prior to Wards 2A and 2B reopening.

Therefore, NHS S Assure based on the comprehensive information presented to us, are able to support the reopening of wards 2A and 2B at QEUH, subject to NHSGGC confirmation (received in the joint meeting on 24th February) of their action plan and commitment to address the issues identified.

J Critchley
Director NHS S Assure

1 Introduction

- 1.1 The following is a response by Multiplex Construction Europe Limited ("Multiplex") to the expert report prepared by Dr J.T. Walker dated 21 January 2024 ("Expert Report").
- 1.2 Multiplex is grateful for the opportunity to assist the Inquiry in relation to the Expert Report.
- 1.3 The above being said, the breadth and depth of issues covered in the Expert Report encompasses the entire water system (including drainage) at QEUH. The Inquiry will recall that the S21 Notice initially issued in early 2023 relating to water at QEUH was similarly broad and Multiplex advised that it would take between 6 and 12 months to comply with that notice as drafted. In the event, the S21 Notice was varied so as to considerably narrow the scope, but still resulting in a time for compliance of 3 months. Standing that, a period of 5 weeks to respond to the Expert Report has not allowed Multiplex sufficient time to investigate the whole factual background and formulate a response to all of the matters raised in the Expert Report. Further, Multiplex would highlight the issue it raised with the Inquiry that it has been unable to locate copies of all of the documents referred to in the Expert Report.
- 1.4 In the limited time made available, and with a view to assisting the Inquiry, Multiplex has prepared the commentary below.
- 1.5 Having regard to Section 2(1) of the Inquiries Act 2005, Multiplex's position set out in this response is provided solely to assist the Inquiry's understanding and is without prejudice to and under reservation of any further submissions Multiplex may make or evidence it may lead in any forum.

2 Commentary

- 2.1 By way of initial comment, Multiplex would note that the decision as to the date when patients were to migrate to the QEUH was a matter for GGHB.

Guidance

- 2.2 Multiplex would respectfully direct the Inquiry to the Employer's Requirements (forming part of the construction contract) which set out the NHS Mandatory, Guidance and Additional Documentation at sections 5.1.2 to 5.14 in relation to the design, installation and testing of the Works.
- 2.3 The Employer's Requirements go on to provide that "*NHS Publications and other published guidance shall be deemed to mean those in place at the date of signing the construction contract. Any date reference in Table 2 or Table 3, therefore, may be replaced/read as that in place at the date of signing the construction contract.*"¹
- 2.4 In the interests of clarity, Multiplex note that Dr Walker in the Expert Report makes reference to various versions of guidance that:

¹ Employer's Requirements Section 5.1.1.19.

- 2.4.1 post-date those applicable to the construction contract;
- 2.4.2 contain incorrect published dates²; or
- 2.4.3 were not published at the date of signing the construction contract³.
- 2.5 The versions referred to by Dr Walker may be versions applicable to the maintenance and operation of the QEUH post-handover, however they were not applicable to the Works under the construction contract.
- 2.6 Examples of the foregoing include, but are not limited to, the following:
- 2.6.1 **HTM 02 Part A Medical gas pipeline systems Part A 2012**, - the version applicable at the date of the construction contract was DRAFT 2009;
- 2.6.2 **SHTM 2027 Hot and cold water supply, storage and mains services 2011**. The year appears to be incorrect and should refer to 2001 as the document was archived in 2011;
- 2.6.3 **SHTM 04-01 Part A Control of Legionella...drinking systems Part A Published 2014**. The version applicable at the date of signing the construction contract was 1.0 December 2008;
- 2.6.4 **SHTM 04-01 Part B Control of Legionella...drinking systems Part B Published 2014**. The version applicable at the date of signing the construction contract was DRAFT March 2009;
- 2.6.5 **HBN 00-02 Sanitary spaces (updated 2016)**. The version applicable at the date of signing the construction contract was 2008;
- 2.6.6 **SHTM 2040 (2011) The control of legionellae in healthcare premise-s - a code of practice**. The year appears to be incorrect and should refer to 1999/2001 as the document was archived 2011;
- 2.6.7 **HSE Document L8 Legionnaires' disease. The control of Legionella bacteria in water systems. Approved Code of Practice. Updated 2013**. The version applicable at the date of signing the construction contract was 3rd Edition published 2000;
- 2.6.8 **SHTM 04-01 Part C 2015**. The current version available on NSS website is February 2014;
- 2.6.9 **SHTM 04-01 Part C, D, E, F & G** These documents had not been published at the date of signing the construction contract.

² Expert Report paragraph 4.2.2.

³ Expert Report paragraph 6.1.1.

System descriptions

- 2.7 Multiplex note that some of the system descriptions provided by Dr Walker do not accurately represent the developed design and as-built position. It is possible that the descriptions adopted by Dr Walker have been taken from project documentation prior to the design development and review process.⁴

Domestic water system temperatures

- 2.8 At various sections of the Expert Report, Dr Walker when expressing domestic water system temperatures, identifies the hot water flow at 60°C, with a hot water return to the calorifier of at least 55°C⁵.

- 2.9 Multiplex note that the return temperature of 55°C does not align with that stated in the applicable NHS guidance:

2.9.1 SHTM04-01 Part A 2008

2.9.1.1 Section 9.5 "*the minimum temperature of all return legs to the vessel or water heater should be 50°C.*"; and

2.9.1.2 Section 9.43 "*The minimum flow temperature of water leaving the calorifier/water heater should be 60°C at all times, and 55°C at the supply to the furthestmost draw-off point in the circulating system. The minimum water temperature of all return legs to the calorifier/water heater should be 50°C.*"

- 2.10 The above quoted 2008 extracts remain the same within the 2014 version.

Flexible connections

- 2.11 Multiplex notes the provisions of the Employer's Requirements as to the use of flexible connections.⁶

- 2.12 Multiplex would also note that there is essential equipment within hospitals which are subject to vibration or articulation where flexible hoses are required for connecting equipment to distribution pipework.

- 2.13 SHTM 04-01 Part A 2014 introduced section 11.35 considering flexible hoses with alternative lining materials to EPDM.

2.13.1 "*New lining materials are now available such as polyethylene (PE), cross-linked polyethylene (PEX), linear low-density polyethylene (LLDPE) and post chlorinated PVC (PVC-C).*"; and

2.13.2 "*Where flexible hoses must be used for the likes of essential equipment subject to vibration or articulation, such as hi-low baths, consideration would be given to using the above listed alternative lining materials.*"

- 2.14 However, in the version of the SHTM 04-01 Part A document which was current at the time of the construction contract, no such guidance was in place.

⁴ Expert Report paragraphs 4.4.1, 4.35.1 to 4.35.4 (non-exhaustive).

⁵ Expert Report paragraphs 4.22.2, 5.12.3, 5.13.3, 6.17.3 and 7.15.5 (non-exhaustive).

⁶ Expert Report paragraphs 4.26.1, 4.26.3, 4.32.1, 6.5.1 and 6.25.1 (non-exhaustive).

- 2.15 Under the construction contract equipment procurement and installation was categorised by the following groups:
- 2.15.1 Group 1 - Equipment is supplied and installed by Multiplex;
- 2.15.2 Group 2 - Equipment is supplied by GGHB and installed by Multiplex;
- 2.15.3 Group 3 - Equipment is supplied and installed by GGHB.
- 2.16 Group 1 equipment (with flexible hoses) includes items such as double height sinks, macerators / sluice machines and raise / lower baths.
- 2.17 Group 2 and 3 equipment procured by GGHB includes items such as dishwashers, vending machines, and water coolers. Multiplex understands that these items were provided with flexible connections.
- 2.18 GGHB surveys / procurement records should indicate the type of hoses / lining materials procured by GGHB for group 2 and 3 equipment.

Deadlegs

- 2.19 Dr Walker notes "*the hot water return should be local to the outlet*"⁷; "*longer "deadlegs" to the outlets than SHTM 04-01 advised*"⁸ and "*deadlegs of excessive length of up to 2.9-3m*"⁹.
- 2.20 Multiplex would respectfully submit that the foregoing is contrary to the applicable guidance at the date of the construction contract being signed.
- 2.21 The applicable SHTM 04-01 Part A 2008 at section 9.49 provides "*the complete length of the spur should not exceed 3 m.*"
- 2.22 The domestic water services design was submitted under the construction contract review process detailing "*The maximum length for the HWS flow dead leg to any fitting shall not exceed - 3.0 meters.*"
- 2.23 The design drawings were reviewed and approved by GGHB providing a status A.

Copper Tails

- 2.24 Multiplex is not aware of microbial associated corrosion on the surface of copper pipework¹⁰.
- 2.25 Multiplex understand that the domestic water services distribution pipework is stainless steel and not copper¹¹.
- 2.26 Copper tails are present at certain water outlets where the tails were supplied with the outlet. Such outlets are from the manufacturer's healthcare range. Stainless steel tails have only more recently been introduced by manufacturers.

⁷ Expert Report paragraph 4.22.2.

⁸ Expert Report paragraph 6.4.5.

⁹ Expert Report paragraph 6.4.6.

¹⁰ Expert Report paragraph 6.3.6.

¹¹ Expert Report paragraph 4.15.1.

- 2.27 Such outlets were reviewed, approved and provided a status A by GGHB during the reviewable design process.
- 2.28 Submissions BMCE-XX-XX-DC-001 to 052 (GGHB status A) detail where copper tails were being provided as part of the outlet assembly. For example, "*Contour 21 washbasin mixer thermostatic 1 hole, single sequential long lever, copper tube inlet*".

Horne Taps

- 2.29 Multiplex note the following in relation to the Horne taps fitted in the QEUH & RHC¹²:
- 2.29.1 during 2014 GGHB agreed that the taps installed complied with current guidance at the time of specification and briefing; and
- 2.29.2 In June 2014 GGHB agreed with HFS that the taps fell into the 'retrospective' category, not 'new-build' and that there was no need to apply additional flow control facilities or remove flow straighteners, with any residual perceived or potential risks forming part of the routine management process. GGHB confirmed that no further action was required by Multiplex and the item was closed¹³.

Miscellaneous

- 2.30 Multiplex understand that a RAID server¹⁴ was provided as part of the building management system.
- 2.31 Dr Walker notes SHTM 04-01 Part A provides that "*Strainers can be a source of Legionella and Pseudomonas bacteria and should be removed after commissioning has been satisfactorily completed*".¹⁵ Multiplex understand this differs from the guidance applicable at the date of signing the construction contract. The applicable SHTM 04-01 Part A 2008 at section 9.56 provided that "*Strainers can be a source of Legionella bacteria and should be included in routine cleaning, maintenance and disinfection procedures (see Chapter 7, Part B)*."
- 2.32 Multiplex is happy to discuss this response with the Inquiry team if it would be of assistance.

¹² Expert Report paragraph 6.20.4.

¹³ GGHB EW Tracker dated 2 July 2014.

¹⁴ Expert Report paragraph 4.33.2.

¹⁵ Expert Report paragraph 6.20.10.



Scottish Hospitals Inquiry

By Email: legal@hospitalsinquiry.scot

[Uploaded via Objective Connect Workspace]

Our Ref: RIL.T10513091

Your Ref:

Date: 11 June 2024

Please Ask For: Ruth Lawrence

Email:

Direct Dial:

Dear Sirs

Our Client: Currie & Brown UK Limited
Re: Queen Elizabeth University Hospital, Glasgow

We write with reference to the expert report of Dr J.T. Walker regarding the water and waste-water system at the Queen Elizabeth University Hospital (“**QEUH**”) and in accordance with the directions in the email from the Inquiry Solicitor dated 7 May 2024.

This is the response to Dr Walker’s report on behalf of our client Currie & Brown UK Ltd (“**Currie & Brown**”).

References to paragraph numbers below are to the numbered paragraphs of Dr Walker’s report.

Responses to Dr Walker’s Report

Para 3.2.5: “September 2008 Currie & Brown were appointed as Lead Consultant on a wide ranging role covering design, project management, design support services, and site supervision. The Lead Consultant then prepared the Employer’s Requirements to capture NHS GGC’s brief for the project.” [emphasis added]

1. The description of Currie & Brown as “*Lead Consultant*” is not entirely accurate for the following reasons:
 - 1.1. The role of ‘Lead Consultant’ on a ‘design and build’ project is usually a function which is fulfilled by the design consultant who leads the main contractor’s design team.
 - 1.2. Currie & Brown was engaged directly by NHS GGC to provide design consultancy services for the initial pre-construction phase of the project. Although the appointment referred to Currie & Brown as “*Lead Consultant*”, Currie & Brown was not engaged by the main contractor, Multiplex Construction Europe Ltd (“**Multiplex**”), and was never a member of Multiplex’s design team.

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- 1.3. After the Main Contract for the design, engineering, and construction of the QEUH was awarded by NHS GGC to Multiplex (on 18 December 2009), Currie & Brown's role on the project changed, and became considerably more limited (as explained further below). During that phase of the project, Currie & Brown was appointed directly by NHS GGC to provide certain limited services; Currie & Brown therefore remained 'client-side' throughout the remainder of the QEUH Project.
2. Currie & Brown's appointment was not "*wide-ranging*" and did not cover all of "*project management, design support services, and site supervision*" either before or after the award of the Main Contract:
 - 2.1. Currie & Brown was engaged by NHS GGC to provide design services during the initial pre-construction phase of the project, prior to the award of the Main Contract to Multiplex. Currie & Brown discharged this role through a team of sub-consultants, namely:
 - (a) Aecom Infrastructure & Environment Ltd (then known as URS Corporation Ltd) ("**Aecom**"), civil and structural engineers and CDM Coordinator;
 - (b) Buchan Associates ("**Buchan**"), healthcare planning consultants;
 - (c) HLM Architects (later known as HLMAD Limited) ("**HLM**"), architects; and
 - (d) TÜV SÜD Limited (formerly known as Wallace Whittle Limited) ("**TÜV**"), building services engineers.
 - 2.2. After the award of the Main Contract, Currie & Brown was not engaged to provide either design services or design support services: Multiplex engaged its own design team to take the project forward. As explained above, Currie & Brown was not engaged by Multiplex and did not form part of the design team.
 - 2.3. After the award of the Main Contract, Currie & Brown was engaged by NHS GGC to provide support to NHS GGC in the latter's role as the named NEC3 Project Manager, but Currie & Brown was not the Project Manager.
 - 2.4. The support services which Currie & Brown was engaged to provide during this post-award stage were limited: they included monitoring construction progress and programme reviews; supporting close-out of design decisions by NHS GGC; attending project management meetings, progress meetings, early warning meetings, and NEC Project Supervisor meetings (which were chaired and minuted by NHS GGC); and providing commercial management support and ad hoc design reporting. Currie & Brown was also engaged by NHS GGC to discharge the CDM Coordinator function (which Currie & Brown did through Aecom).
 - 2.5. In accordance with this considerably more limited role post-award, and on NHS GGC's instructions, Currie & Brown therefore stood down Aecom (in respect of the function as

civil and structural engineer), Buchan, HLM, and TÜV from their pre-award roles and instead they were retained by Currie & Brown only on a limited 'call off' basis to provide ad hoc advice as and when required (with the exception of Aecom, who continued to be engaged to carry out the CDM Coordinator function).

2.6. Currie & Brown did not provide any “*site supervision*” services at any time. Prior to the award of the Main Contract, Currie & Brown submitted a quotation for the role of NEC Project Supervisor. This quotation was not accepted, and Currie & Brown was not part of the formal tender process for the role of NEC Project Supervisor. Instead, Capita Property and Infrastructure Ltd (formerly known as Capita Symonds Limited) (“**Capita**”) was appointed by NHS GGC as NEC Project Supervisor.

3. For the above reasons, Currie & Brown would respectfully suggest that paragraph 3.2.5 should more accurately say as follows: “

“September 2008 Currie & Brown were appointed by NHS GGC to provide design consultancy services for the pre-construction phase of the project. Currie & Brown then prepared the Employer’s Requirements to capture NHS GGC’s brief for the project”.

4. For the same reasons, Currie & Brown would also respectfully suggest that the reference to “*Lead Consultant*” in paragraph 3.2.7 should more accurately be changed to “*Currie & Brown*”.

Para 3.3.2: *“Prior to handover problems were identified in the water system design (over capacity and lack of detail in water components), build (unhygienic plumbing practices, deadlegs, stagnation after filling between build and commissioning, inappropriate tap fittings), commissioning (inappropriate concentrations and contact time period and high total viable counts post commissioning) and pre-handover (lack of written scheme and training of NHS GGC).”* [emphasis added]

5. Currie & Brown is not aware that any of the problems listed in paragraph 3.3.2 were identified (or reported) prior to handover, although this is a process that was managed by Multiplex (as Main Contractor) and Capita (as NEC Project Supervisor). Currie & Brown was not involved in handover and would therefore defer to Multiplex and Capita on this point. However, so far as Currie & Brown is aware, Multiplex cleaned and commissioned the water system, and it was approved on handover.

Para 3.3.3: *“Following the water microbiology testing in December 2014, NHS GGC refused to accept the handover of the hospital and insisted that disinfection of the water was undertaken prior to the handover taking place to improve the microbiological quality of the water.”*

6. Currie & Brown’s understanding is that handover of the hospital was not scheduled to take place until January 2015. Currie & Brown was not involved in the handover process, as explained above; but is not aware that the hospital was ever offered for handover prior to

January 2015, or that NHS GGC refused to accept handover of the hospital (either during or before January 2015).

7. So far as Currie & Brown is aware, the water microbiology testing referred to in paragraph 3.3.3 was part of commissioning and was not part of the process for offering the building for handover, although Currie & Brown would again defer to Multiplex and Capita on that point.

Paras 4.2.1 to 4.2.2:

“4.2.1. NHS GGC described the design parameters and guidance in their Employer’s Requirements (ERs). These documents (Table 3) set out the legal requirements and guidance which had to be observed with respect to water systems during design, construction, commissioning and maintenance in accordance with all appropriate Scottish Hospital Technical Memoranda, Codes of Practice and relevant British and European Standards, Scottish Water Regulations (Byelaws) and to the approval of the local Water Authority and Appendix A (Table 3). However, at the time of publication some documents referred to in the Employer’s Requirements were incorrectly referenced, superseded at the time of construction and therefore, were misleading.”

4.2.2. Regulations and industry standards specifications to which the hot and cold water system were designed, built and commissioned. These documents were originally cited in the Employer’s Requirements, however, dates were not provided in that original document. Many of the documents referred to in this section were incorrectly referenced, superseded at the time of construction and therefore could be misleading. Being historical, archived or superseded documents may mean that the dates referenced below are not necessarily correct as very few dates if any were provided with these documents the Employer’s Requirements.” [emphasis added]

8. Dr Walker has not identified which documents he says were incorrectly referenced or in what respects. Currie & Brown disputes that any guidance, regulations, or standards referred to in the Employer’s Requirements were incorrectly referenced or misleading.

9. Dr Walker has not referred to Paragraph 5.1.1.9 of the Employer’s Requirements, which stated:

“All references in these Employer’s Requirements to NHS Facilities Scotland Requirements, building and engineering standards, Building Regulations, legislation, Statutory Requirements, Codes of Practice, Department of Health publications, NHS Publications and other published guidance shall be deemed to mean those in place at the date of signing the construction contract. Any date reference in Table 2 or Table 3, therefore, may be replaced/read as that in place at the date of signing the construction contract.”

10. This was and is a standard and accepted approach to the specification of guidance, regulations, and standards in the Employer’s Requirements. It provided certainty and clarity about which versions or revisions of the guidance, regulations, and standards were to apply. Furthermore, it is standard and accepted practice that the applicable guidance, regulations, and standards would be those current at the date of signing the construction contract – again, this is a practice designed to ensure certainty and clarity.

Para 4.8.1: *“Each raw water storage tank has a capacity of 100,000 litres, giving a total raw water storage of 200,000 litres (Figure 8 and 9).”*

11. As explained in Currie & Brown’s response to Provisional Position Paper 11 by letter dated 11 April 2024, drawing no. ‘ZBP Equipment Data Sheet ZBP-XX-XX-SH- 600-366 Rev A Jun 12 (Approved Status A)’ refers to two break tanks each with a 125,000 litre capacity. A copy of that drawing was submitted as Document 10 with Currie & Brown’s response to the Provisional Position Paper by letter dated 11 April 2024.
12. For the avoidance of doubt, this is an as-built drawing which suggests that the raw water storage tanks as installed each have a capacity of 125,000 litres, although Currie & Brown has not inspected those tanks to verify that.

Para 4.12.3: *“Description of the water storage tanks. Please note discrepancy in tank size stated in different literature, however, schematic in Figure specifies 225,000 litres”*

13. As explained in Currie & Brown’s response to Provisional Position Paper 11 by letter dated 11 April 2024, drawing no. ZBP Equipment Data Sheet ZBP-XX-XX-SH-600-366 Rev A Jun 12 (Approved Status A)’ refers to two tanks each with a 243,750 litre capacity. A copy of that drawing was submitted as Document 10 with Currie & Brown’s response to the Provisional Position Paper 11 by letter dated 11 April 2024.
14. For the avoidance of doubt, this is an as-built drawing which, again, suggests that the two filtered water storage tanks as installed each have a capacity of 243,750 litres, although Currie & Brown has not inspected those tanks to verify that.

Para 4.15.1: *“The Employer’s Requirements stated that, in respect of water systems and filtration, “Pipework shall be stainless steel with compatible accessories”. However the photographic evidence (P6 of the DMA 2015 report and item 6 photo in Storrar and Rankin) only indicates the presence of copper for the main domestic hot and cold water system.”*

15. Currie & Brown was not aware at the material time that any copper piping had been used in the water systems and filtration, contrary to what Currie & Brown had specified in the Employer’s Requirements. For the avoidance of doubt, Currie & Brown is not aware that there was any variation or instruction to change the specification in this regard.

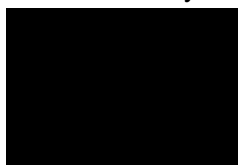
Para 4.33.2: *“It is noted that the specification called for a server to be provided, the storage of which was to be sized to accommodate (amongst other things) access of system archive information for a period of 53 weeks on a rolling basis. It is further noted that the storage should have been a Redundant Array of Independent Disks (RAID) configuration with automatic redundancy. A RAID is a data storage technology that combines multiple physical discs drive components into one or more*

logical components to improve data security and performance. A RAID server was not supplied under the contract.

16. Currie & Brown was not aware at the material time that the RAID server was not supplied or installed, contrary to what Currie & Brown had specified in the Employer's Requirements. For the avoidance of doubt, Currie & Brown is not aware that there was any variation or instruction to change the specification in this regard.

If any further information or clarification is required by the Inquiry, then Currie & Brown would of course be happy to provide this.

Yours faithfully



Keoghs LLP

SCOTTISH HOSPITALS INQUIRY
REVIEW BY NHSGGC
OF
REPORT FROM DR J WALKER
DATED 21 JANUARY 2024

[1] A report from Dr James Walker, dated 21 January 2024, was disclosed to core participants on 22 March 2024. With reference to Scottish Hospitals Inquiry Direction 5, Appendix B at para 2.1, specific questions to be asked of the report's author, and specific comments on the substance of the report, are set out below. The questions and comments raise new matters or issues insofar as they relate to matters either not covered or not fully addressed in the report. It is understood that, in terms of Direction 5, the questions and comments below will be considered and addressed by the report's author and that a supplementary report will be prepared thereafter on that basis.

Key themes of questions and comments on report

[2] Questions and comments on behalf of NHSGGC on the report from Dr Walker relate to 8 main themes, principally:

- (i) the expertise of the witness;
- (ii) the focus by Dr Walker on guidance specific to the control of legionella and pseudomonas aeruginosa and the conflation of that guidance with considerations relative to other micro-organisms;
- (iii) the equiperation by the witness of the presence of micro-organisms in water with what he describes as "contamination"
- (iv) the approach to the assessment of risk;
- (v) the approach to the assessment of what constitutes an unsafe water system;
- (vi) the approach by the witness to the interpretation of water testing results and the significance of microbiological findings;
- (vii) material and measures not considered by the witness;
- (viii) the conclusions offered on the present day assessment of the water systems at QEUH/ RHC.

- (i) Expertise of the witness

[3] The witness does not have expertise or experience of molecular strain typing or the application of whole genome sequencing. He has no expertise or experience in the

identification of genetic linking of organisms. He has no expertise or experience in the assessment of clinical risk.

(ii) Guidance specific to the control of legionella/ pseudomonas aeruginosa

[4] Throughout the report, there is conflation of legionella guidance with control of all other waterborne organisms. Legionella guidance is very specific guidance to ensure that there is no proliferation of legionella within a water system. Legionella guidance does not extend to the control of other naturally occurring environmental bacteria.

[5] At para 2.3.1, it is stated that “Guidance is available for Scottish hospitals to assess the risks of waterborne pathogens **such as** legionella and pseudomonas aeruginosa.” Specific guidance is available to assess risk of legionella and pseudomonas aeruginosa. However, there is no guidance available specific to any other bacteria or pathogen.

[6] Whilst focusing on available guidance specific to legionella, Dr Walker’s report does not acknowledge that such guidance has no application whatsoever in the control of any and all other waterborne organisms.

[7] Further, he does not acknowledge that, whilst there were occasional isolations of legionella identified through testing over the relevant period, legionella was not, at any stage, a widespread problem within QEUH/RHC. At para 7.5.1, the report references legionella testing results and states that legionella was only rarely detected in the new build QEUH/RHC between 2018 and 2020: it is more accurate to state that legionella was only rarely detected in the new build QEUH/RHC between late 2015 and 2020. The paragraph further states “Whilst L.pneumophilia serogroup 1 was rarely detected in the retained estates, L.pneumophilia serogroup 2-14 were detected frequently.” This sentence is a mis-statement of the testing results which it references (reports from Dr Dominique Chaput) which, in fact, state: “Across the retained buildings, Lp.1 was **almost absent**, whereas Lp.2- 14 and L. species were detected **more** frequently.” Whilst Lp2- 14 and L.species were detected more frequently than Lp.1, which was virtually absent, there was no frequency to these findings when looked at in isolation. In any event, the Inquiry is concerned with the new buildings of the QEUH/RHC and not the retained estate.

(iii) The description of the hospital water system as “contaminated”

[8] At para 2.3.4, it is accepted that “hospital water supplies are not sterile”. Implicit in that statement is an expectation that micro-organisms will be present in hospital water supplies. It is further stated in the same paragraph that “waterborne infections can be prevented.” Waterborne infections cannot be absolutely prevented but the risk can be reduced.

[9] The term “contamination” is used throughout the report. This is at odds with the apparent recognition that bacteria will be present, and will be expected to be present, in hospital water supplies.

[10] The report variously references the water testing reports prepared by Dr Dominique Chaput in support of the assertion that the water system at QEUH/RHC was “contaminated.” Dr Chaput’s reports do not make any such conclusion, either implicitly or explicitly. Dr Chaput’s reports do not, at any point, state that the water systems were “contaminated.”

[11] The witness does not offer any explanation or threshold for what he suggests may amount to “contamination” by any particular micro-organism. From the perspective of water testing, the strictest definition of “contamination” would be a substance or micro-organism that should not be present and that renders the water impure, polluted, or unsafe. A clear example is the presence of coliform bacteria, including E.coli, as these are indicators of faecal contamination and, as such, something that was introduced into the water distribution system that should not be there.

[12] “Contamination” is not an appropriate description to be used in the context of the finding in water of micro-organisms that are naturally expected to be there, nor is it a description with any scientific meaning in the absence of clear and recognised thresholds.

(iv) Assessment of risk

[13] Dr Walker has no experience or expertise in the assessment of clinical risk. The report proceeds on the hypothesis that mere presence of an organism, at any level, in water constitutes both contamination and an absolute risk to all patients. The author advocates a very low threshold of risk where presence of an organism in water is deemed to be a risk, without reference to additional risk, or clinical risk. The report conflates patients in the general sense with high-risk patients.

[14] The report confuses breaches of the QEUH/RHC internal thresholds, which were developed for surveillance purposes, as evidence of risk. QEUH/RHC thresholds are deliberately set to a very low level, to maximise their efficacy in identifying early changes in the water system. It is trends that reflect the health of a water system and not individual out of specification results. QEUH/RHC thresholds, as a consequence of being deliberately set at a very low level, are more onerous and challenging than current industry standards, where such industry standards exist.

[15] Whilst the author recognises that hospital water is not sterile, it is nonetheless asserted throughout the report that the presence of organisms in water present a risk. The presence of micro-organisms in water is expected and does not present automatically present a risk in isolation. The report offers no thresholds for acceptable levels of organisms in water, nor does it offer any assessment as to what a safe water system might look like. There is no discussion or context offered as to what a tolerable risk level might be in terms of water testing.

(v) Assessment of what constitutes an unsafe water system

[16] In offering opinion on what constitutes an unsafe water system, the report places focus on microbial counts in water being above “set thresholds.” There is no national (or international)

guidance on thresholds for microbial counts. It is not clear which set thresholds the report relies upon.

[17] At para 5.1.15 (ii), the report states that “Indications of an unsafe water system include... Microbial counts that have exceeded set thresholds.” No such thresholds are set within any guidance. Where thresholds for water testing were set within QEUH/RHC, these were set by NHSGGC itself on its own initiative, for the purpose of surveillance.

[18] At para 5.6.4, the report sets out factors which could render a water system unsafe, including “where colony counts are above the threshold.” It is not explained what is meant by “colony counts.” If the statement is intended to refer to testing for total viable counts (TVCs), there are no defined thresholds for TVCs. Guidance suggests only that the TVC testing can be useful for trend analysis. NHSGGC has chosen to have unusually strict thresholds for TVC testing for its own internal monitoring purposes. Exceeding these thresholds, which are not national standards, does not equate to an unsafe water system.

[19] The report offers no indication of what threshold exceedance equates to patient risk.

[20] The report considers healthcare-associated infections (HAIs) and, at para 5.5.10, states that these are preventable. Not all HAIs are preventable, as patient factors play a significant role.

[21] At para 5.1.3, the report makes reference to the NICE definition of a HAI. The term “healthcare associated infection” applies when, after review, a person suffering from infection has been in contact with some part of the healthcare system within the preceding 30 days. The purpose of term is as a statistical tool for surveillance purposes. It does not actually mean the hospital, or any other healthcare environment, is necessarily the source of the infection.

[22] At para 5.11.3 and 5.11.6, the report lists three factors which “result in an increased risk of microbial contamination” of water systems, namely: (i) physical infrastructure; (ii) management and operation of the system; and (iii) microbial contamination of the water system. It is not clear what is meant by microbial contamination of a system resulting in an increased risk of microbial contamination.

[23] At para 5.30.3, the report states that “Unsafe water could be described as water where the thresholds of agreed/ industry standard total viable counts for waterborne pathogens have been exceeded.” It is not clear to which thresholds or industry standards the report refers. There is no national guidance on such thresholds.

(vi) Approach taken to interpretation of water testing results and significance of microbiological findings

[24] The report proceeds on the hypothesis that presence of bacteria in water amounts to contamination and that any such presence will constitute a risk to health of any and all patients. This hypothesis ignores the reality that waterborne organisms are expected to be present in water, even water which is categorised as “wholesome” and potable. Further, the hypothesis

offers no analysis on any threshold of bacterial presence in water beyond which a risk can be said to be present.

[25] At para 7.1.2, the report states that “Reports indicated that a high number of children and young adults experienced episodes of infections due to Gram-negative environmental (GNE) bacteria, from 2015 to 2019.” Waterborne opportunistic bacteria cannot be eliminated entirely from any environment where water is used. Only if infection rates were much higher than in similar units could there be considered to be a problem. Dr Walker does not offer any comparative data to demonstrate that incidence of infection over this period was unusual or of a degree greater than that which might be expected in any other hospital. The infections experienced at QEUH/RHC over the period under consideration by the Inquiry were not unusual, either in the nature of the bacteria which caused those infections or in the frequency of the occurrence of those infections.

[26] At para 6.1.9, the report makes reference to water testing results at QEUH/RHC and states that the presence of organisms in the water at the hospital “provides evidence of increased risk to patients when exposed to water in the hospital.” There is no discussion in the report about appropriate organism thresholds in non-sterile water for out of specification sample results. There is no discussion as to what magnitude of bacterial growth above a threshold may indicate a clinical risk.

[27] The report refers to “set thresholds” in testing water for the presence of organisms. There are no set thresholds in any national guidance. The thresholds upon which the witness relies in offering opinion on the significance of microbiological findings are those set by NHSGGC itself.

[28] At para 2.1.16, Dr Walker offers opinion that micro-organisms detected in the water samples at QEUH/RHC “were similar strains to those causing infections in patients.” This statement is unsupported by data. There is no evidence that typing showed any similarity between the environmental and patient micro-organisms over the period with which the Inquiry is concerned. This lack of similarity was confirmed by whole genome sequencing. Dr Walker does not have expertise in whole genome sequencing. Expert evidence on whole genome sequencing, and its application in the investigation of infections within QEUH/RHC, will be given to the Inquiry by Professor Alistair Leanord, Glasgow Royal Infirmary, and Professor Peter Hawkey, Emeritus Professor of Clinical and Public Health, University of Birmingham, both of whom have expertise on the subject.

(vii) Material and measures not considered by the witness

[29] The report does not indicate the level of risk reduction measures in place currently within the QEUH Campus. There is no reference to the work undertaken by the Water Technical Group which include a multi-discipline participant team. The WTG was formed to deal with the specific issues and water infrastructure changes as part of the management of the water problems identified.

[30] There is no acknowledgement in the report of the national guidance in the National Infection Prevention and Control manual, nor is there any recognition that NHSGGC followed the guidance in that manual at all times. The report gives no commentary on what could be reasonably expected in a large complex water system in terms of microbial health other than to state that the finding of aquatic organisms in a non-sterile medium represents a risk. This is compounded by the absence of any comparator(s) sites to which standards in NHSGGC can be compared with. Dr Walker proposes subjective idealistic standards in the absence of any agreed national ones.

[31] There is no acknowledgement within the report of the extent of the routine water testing currently carried out within QEUH/RHC, as detailed in the reports of Dr Chaput. NHSGGC has conducted, and continues to conduct, more surveillance of its water system than any other NHS board. All routine water testing currently carried out across QEUH/RHC exceeds requirements and recommendations set out in national guidance (where such guidance exists), in terms of testing frequency, locations tested (general as well as high-risk), types of tests performed, and thresholds to trigger action. Much of the routine testing carried out at these sites, notably coliforms, E.coli, fungal counts, gram negative bacteria, and mycobacteria, is bespoke to NHSGGC, as there are no formal requirements or recommendations applicable to these tests.

[32] Gram negative testing, as is routinely performed in QEUH/RHC, is not a routine test type (unlike TVCs, which are routine but don't have set thresholds), and it is done per 100 ml rather than per 1 ml as in standard TVCs. There is far less evidence available to help with interpretation of Gram negative testing. However, a key paper published in the Journal of Hospital Infection (Inkster et al. 2022, JHI 123:80) showed that when water samples from ten UK hospitals (not including the QEUH/RHC) underwent the same bespoke Gram negative water testing as is done routinely at the QEUH/RHC, 99 out of 157 samples (63%) were positive for Gram negative bacteria. This study was published by Dr Walker's frequent collaborators (Dr T.Inkster, Dr M.Weinbren) and gives much-needed context to the Gram negative testing carried out by NHS GGC. Dr Walker states that the detection of Gram negative bacteria at the QEUH/RHC is evidence of increased risk and an 'unsafe' water system, but he omits published evidence showing that, were the same standards applied to other UK hospitals, they would also be deemed 'unsafe'. The omission of this paper from Dr Walker's report requires explanation.

[33] Whilst there are clear recommendations for legionella and pseudomonas aeruginosa water testing in healthcare settings, guidance is minimal or absent for the other water tests routinely carried out in QEUH/RHC.

[34] There is no acknowledgement in the report of the extensive work of the IMTs in investigating infections within QEUH/RHC, including presentations to the IMT on whole genome sequencing undertaken in relation to microbiological sampling.

(viii) Present-day assessment of water systems in QEUH/RHC

[35] Dr Walker's assessment of the present-day condition of the water systems within QEUH/RHC fails to recognise the impact of the substantial construction work which has been undertaken, including the recommissioning of wards 2A and 2B of RHC. Further, his assessment of the safety of the hospital is against a background of a flawed approach to the assessment of the significance of microbiological findings.

[36] The report does not accurately reflect the timeline of events in the recommissioning of wards 2A and 2A in RHC between September 2021 and February 2022. At para 7.11.12, the report states that water system components within ward 2A and 2B of RHC were heavily colonised with gram-negative micro-organisms, despite refurbishment and extensive biocide treatment. It is not clear to which point in time Dr Walker refers. The information given to Dr Walker shows that treatment of the water system with chlorine dioxide took place in October 2021 and treatment with silver ion hydrogen peroxide took place in December 2021. Microbial counts clearly decreased following the second treatment.

[37] At para 7.11.18, the report suggests that, during the recommissioning of ward 2A/B, water outlets were tested and were "microbially re-contaminated following one week of use." This is not correct. Information provided to Dr Walker shows that results of routine sampling of all outlets, with and without point of use filters, shows no evidence of microbial recolonisation.

[38] At para 7.11.24, Dr Walker expresses concern that microbial counts were detected from point of use filters. It is unrealistic to expect that no counts should ever be detected from taps with point of use filters. Whilst the filter will remove bacteria present in tap water, the patient room is not a sterile room and there will be micro-organisms in the air and on people who enter the room.

[39] At para 7.11.15, Dr Walker references the decision in 2014 to retain Optitherm taps (which contain flow straighteners) in the QEUH/RHC, despite the emergence at that time of national guidance (SHTM) that flow straighteners should be removed. Further, Appendix 2 of the report features photographs taken from QEUH visits by Dr Walker and others in March and September 2023: figure 50 shows Optitherm taps and queries whether these are compliant with SHTM guidance. Following advice in 2014 on the issue of flow straighteners from Health Protection Scotland, NHSGGC requested a meeting to review the position. A meeting took place on 5 June 2014 and was attended by representatives of NHSGGC, HPS, HFS, Horne Engineering Ltd and Public Health England, including Dr Walker. It was unanimously agreed by the representatives at the meeting, including Dr Walker himself, that, as the taps installed within the new build development had complied with guidance current at the time of its specification and briefing, and as the hospital was, at that time, in the process of being commissioned, it should be regarded as being in the "retrospective" category, not "new build". It was agreed that there was no need for NHSGGC to apply additional flow control facilities or remove flow straighteners within QEUH and RHC and that any residual perceived or potential risks would form part of the routine management process. It is unclear why Dr Walker has made reference to these taps and their status with reference to SHTM guidance in his report.

[40] At para 7.12.3, the report states “Legionella, coliforms, E.coli or cupriavidus were detected from 9 March 2022 to 15 March 2023.” This statement is wrong. The opposite is true. No legionella, coliforms, E.coli or cupriavidus were detected over this period.

[41] The report offers no comparative data to show that there was ever any increased rate of overall infection, or of infections from waterborne micro-organisms, over the period with which the Inquiry is concerned. Testing carried out from 2015 onwards does not demonstrate any note-worthy issue with water quality within QEUH/RHC.

Peter Gray KC

and

Emma Toner, Advocate

28 May 2024

SCOTTISH HOSPITALS INQUIRY

QUESTIONS AND COMMENTS

ON THE

EXPERT REPORT PREPARED BY DR J.T. WALKER DATED 21 JANUARY 2024

SUBMITTED ON BEHALF OF DR CHRISTINE PETERS

1. INTRODUCTION

- 1.1 The following comments and questions on the expert report prepared by Dr J.T. Walker dated 21 January 2024 (“Walker Report”) are submitted on behalf of Dr Christine Peters in accordance with the procedure set out in Appendix B of Direction 5 – in respect of the Hearing Commencing 19 August 2023. References herein to paragraph numbers and defined terms are to such numbers and terms used in the Walker Report unless otherwise stated.
- 1.2 Overall, Dr Peters’ assessment is that the Walker Report is impressive in its level of detail and analysis. The report clearly states that the water and waste system at the QEUH and RHC was unsafe in terms of creating an avoidable risk to patients. The report also clearly underlines that Dr Walker continues to have concerns regarding how the water and waste system is currently being managed at the QEUH and RHC; concerns which Dr Peters shares (*see, e.g.*, para. 2.1.19).

2. THE WALKER REPORT REVEALS INFORMATION NOT PREVIOUSLY PROVIDED TO DR PETERS

- 2.1 While the following are not matters to be addressed by Dr Walker in evidence or any supplemental report, it may be of interest to the Inquiry to learn that, despite Dr Peters’ various roles at the QEUH and RHC over the years, the Walker Report reveals that she was not provided with the following key information:
- 2.1.1 **Para. 6.8, Water Systems Audit by compliance officer - August 2017:** Dr Peters observes with concern that this audit, conducted by P. Urquhart and which is so damning of the water system, was contemporaneous to the requests

being made by Dr Deshpande for water sampling to be carried out and the difficulties he experienced. Reference is made to Dr Peters' statement to the Inquiry at paragraphs 89 to 91. However, Dr Peters was not aware of this audit at the time.

2.1.2 **Para. 6.9.5, Written Scheme for QEUH, December 2016:** As noted by Dr Walker in this part of his report, the risk assessors identified various problems with the Written Scheme. Dr Peters advises that this scheme was not referred to in any communications with QEUH Estates colleagues or the IPCT management in 2017.

2.1.3 **Para. 8.11:** the Legionella Management and Compliance Audit May 2017 referred to by Dr Walker would have been extremely relevant to the discussion in 2017 with QEUH Estates colleagues and the IPCT management.

2.1.4 **Report by Dr Dominique Chaput, dated 3 March 2023, Microbiological testing of water and environmental samples from the Queen Elizabeth University Hospital (Adults) and Royal Hospital for Children 2015-2020 (see Bundle 18, Vol. 1) ("Chaput Report, March 2023"):** The report by Dr Chaput highlights the following areas of which Dr Peters was not made aware:

- Figure 2, Number of *Legionella* tests out of spec per month in different areas of Adult QEUH and RHC, specifically the results in 2015 and 2016. Despite asking for the results, Dr Peters was not informed of the high numbers nor the species as Lp. 1 as in Figure 3 (see Bundle 18, Vol. 1, pp. 25-26).

3. CHAPUT REPORT & PRESENTATION, MARCH 2023: COMMENTS & QUESTIONS

3.1 In relation to the Chaput Report, March 2023 (referred to above), Dr Peters has the following comments and questions:

3.1.1 to understand the genesis of the contamination, has Dr Walker been given information about the 2014 results regarding speciation and TVC levels?

- 3.1.2 Does Dr Walker know if ALcontrol laboratories did the sampling in January 2017 rather than the GRI laboratory and, if they did, what triggered the testing?
- 3.1.3 Does Dr Walker know why AL laboratories did *Pseudomonas* testing in 2016 when the GRI laboratory would normally be expected to do this?
- 3.1.4 Is Dr Walker able to advise if there was a different route of governance for the assessment of the ALcontrol laboratories' results? More specifically, were the results assessed by a South Glasgow Microbiologist?
- 3.1.5 Page 18 of Bundle 18, Vol. 1, does Dr Walker know when the earlier results from paper reports were uploaded onto telepath? Did the results of organisms recorded on the back of the form also get uploaded?
- 3.1.6 In Dr Peters' opinion, it would be useful to understand the number of outlets, not just the number of samples. Would Dr Walker agree?
- 3.1.7 Overall, as there is no mention of the timing of disinfectants or maintenance in relation to the samples from specific outlets which could alter the positive results substantially, e.g., showers for *Stenotrophomonas* in Ward 2A, does Dr Walker agree that the results are not reliable in terms of ruling out sources?
- 3.1.8 Page 24 of Bundle 18, Vol. 1, in relation to the sharing of information, the results are only given to ICDs at the South site and not to the Microbiology Department in general.
- 3.1.9 In relation to remedial actions, they seem to be very outlet specific and not in relation to assessing the overall water system. Would Dr Walker agree?
- 3.1.10 Figure 2, note the high number of out of spec results in 2015 and 2016 and the high risk unit in 2018 - which unit was this?
- 3.1.11 Page 26 of Bundle 18, Vol. 1, regarding the transcription error, the comment that they would have passes does not add up as the other organisms if in a high risk unit would also be of significant failure and these relate only to the high risk areas. Would Dr Walker agree?
- 3.1.12 Page 39 of Bundle 18, Vol. 1, in relation to the addition of organisms to the alert list, this process was meant to include locally relevant organisms. However,

these were not all added to the alerts for RHC and QEUH – does Dr Walker know why?

- 3.1.13 The presence of *Stenotrophomonas* in the tank indicates the ability of strains to reach all areas of the hospital. Would Dr Walker agree that typing results should be interpreted with this in mind rather than looking for patient cross over as per current IPCT investigations?
- 3.1.14 Figure 10, it would be helpful to highlight all the organisms that have been found in blood cultures in the QEUH and RHC, as well as mapping times of infections to the timing of the high counts of those organisms in the sampling. Would Dr Walker agree and, if so, can this be done?
- 3.1.15 Regarding testing for *Pseudomonas* in the high risk units, it would be helpful to understand: if any samples were taken in response to cases, if the samples were taken from the correct outlets and in a timeous manner; and whether any maintenance or cleaning had already taken place. Would Dr Walker agree?
- 3.1.16 Does Dr Walker agree that an omission in the GGC analyses is the absence of all typing results and outlet and time and placement of patients who had bacteraemia?
- 3.1.17 Figure 21, environmental sampling is hard to interpret without specific information of testing and if cleaning had just taken place. Of note is that so many drain and sink samples with no growth is unlikely as these are not expected to be sterile sites. The number of NG samples indicates an issue with the methodology. Does Dr Walker have a comment on the validity of such high proportions of No Growth samples?
- 3.1.18 Most organisms not detected in water would not be expected to be detected in water - mainly skin commensal and *Bacillus* species - this is not noted.
- 3.1.19 In relation to the high risk units, the outpatient clinics where CF patients are seen is not included.

Chaput Presentation, March 2023

- 3.2 In relation to Dominique Chaput’s presentation, “Royal Hospital for Children, Ward 2A/2B water test results”, dated 28 March 2023 (*see* Bundle 18, Vo. 2, at p. 1030), Dr Peters has the following comments and questions:
- 3.2.1 Dr Peters is concerned that TVCs were high even with filters in 2022 and 2023 on occasion - were these related to specific outlets and does Dr Walker have any evidence regarding what actions were taken?
- 3.2.2 Dr Peters observes that the fact that GNBs were being isolated despite filters is concerning – does Dr Walker know how many outlets this affected?
- 3.2.3 Regarding pipe sections removed from 6 rooms - why were these rooms chosen and does Dr Walker think that this is likely the status of all water outlets to the present day?

4. OMISSIONS FROM THE WALKER REPORT

- 4.1 **Para. 2.2.16:** Typing results – how are all cases identified (not only the *Cupriavadis* and the *Mycobacteria chelonae*, but also *Enterobacter*) and typed? It is also unclear how many water/environmental samples were sent in relation to specific cases. Please can this be clarified. Further, in Dr Peters’ opinion, the lack of any specific matches is limited by the strategy for testing and sending for typing. Would Dr Walker agree?
- 4.2 **Para. 3.3.3:** It appears that Dr Walker has not been shown all relevant information regarding results and, instead, has been shown only a sample. Is this also the case for the commissioning results and the 2014 results? Is there a reason why all the results have not been shared?
- 4.3 **Para. 5.1.15:** Dr Walker states that “the water systems associated with chilled beam heaters are known as a closed water system where there is no environmental exposure directly from the water within the chilled beam.” However, this statement does not take account of the leaks which occurred in these systems at the QEUH. At the QEUH, in around June 2019, *Pseudomonas aeruginosa* and *Pseudomonas oleovorans* were grown from water samples taken from the chilled beams supply system.

- 4.4 Have the typing results been analysed in relation to the diversity within the system to aim interpretation of typing results in patient isolates?
- 4.5 **Para. 6.8.1:** No copy of the Authorising Engineer's Audit that is referred to by P. Urquhart in the Water Systems Audit in August 2017 has been provided. When was this undertaken and what did it find?
- 4.6 Do we know how many of the water organisms were typed, with what rationale and whether they have been compared with the patients isolates?

5. APPLICATION OF FINDINGS TO CURRENT PRACTICE

- 5.1 **Bundle 18, Vol. 2, p. 1039 & para. 2.1.19 of the Walker Report:** The summary of the Chaput reports (at Bundle 18, Vol. 2, p. 1039) implies that the results do not in fact provide reassurance regarding the current provision of water. Would Dr Walker agree that the impact of this information on current practicing Microbiologists is very important? Also, in light of the statement at paragraph 2.1.19 (that there are “[h]igh counts and heavy biofilm contamination in the last two metres”) would Dr Walker agree that it is important to assess what this means for current practice?
- 5.2 Of relevance in this regard is that there continues to be debate with the IPCT regarding the utility of targeted water testing or mitigation measures in response to cases. A good example of this is the acquisition of *Stenotrophomonas* in a CF patient that clusters by typing with other cases who have had exposure to the water system in QEUH/RHC. On identifying that this patient had exposure to a tap in outpatients that does not have a POC filter, IPCT refused to do any water testing or to have a filter placed on the outlet. It is Dr Peters' understanding from Dr Bagnade, that the rationale for these decisions is that the water is safe and has always been “wholesome”.
- 5.3 Does Dr Walker consider that the water system as described means that the unfiltered water at the QEUH and RHC continues to pose a risk that warrants measures for higher risk groups including CF patients, ITU and other immune compromised groups?
- 5.4 What are Dr Walker's views on the fact that the adult ITU has at no point had POC filters in place? Does he consider that the unfiltered water still poses a risk particularly when water system biocide treatment may release biofilm?

- 5.5 In Dr Walker's opinion, is it possible that small clusters of environmental infections could occur across multiple sites if biofilm is disrupted in the tank? If so, would an epidemiological link be classified as exposure to any water outlet in the QEUH and RHC as opposed to time, place and person overlap?
- 5.6 **Para. 2.1.19:** Given the current concerns identified in this paragraph of the Walker Report, including high counts and heavy biofilm contamination in the last two metres, what are the implications of these concerns for a testing strategy? It is Dr Peters' understanding that the fact that sentinel points are negative further upstream in the system is being taken as reassurance regarding the outlets.

6. PUBLIC STATEMENTS

- 6.1 Given the findings in his report, what are Dr Walker's views on the accuracy of the following public statements made by GGC and the Scottish Government:

- 6.1.1 In November 2019, GGC and the Scottish Government were reported to have made the following public statements (*see* "HUMAN TRAGEDY' Health bosses 'covering up death of child with cancer who caught bug from contaminated water at Glasgow's superhospital'", The Scottish Sun, 19 November 2019 available at: <https://www.thescottishsun.co.uk/news/4953816/glasgow-superhospital-cancer-bug-contaminated-water/>):

[According to a statement made by GGC] "It is important to make clear that the water supply to the Royal Hospital for Children and Queen Elizabeth University Hospital is safe to use."

Extensive measures have been put in place, including the installation of a water treatment system, as well as filters on water outlets.

The water has been assessed by an independent water expert who has confirmed that it is 'wholesome', meaning it is safe to use."

[...]

[In a further statement released by GGC] The health board said: "Stenotrophomonas is widespread and is present throughout the general

environment. As no tests were carried out at the time, it is not possible to conclude that these infections were connected to the water supply. It is extremely disappointing therefore that a whistle-blower has made this claim causing additional distress to families and to other families of cancer patients.”

- 6.1.2 On 1 December 2019, in an online article titled “Glasgow health chief reassures parents over hospital infection fears” (available at: <https://www.bbc.co.uk/news/uk-scotland-glasgow-west-50621401>), the BBC reported that:

“Jane Grant said that infection control levels had returned to a normal level.

She said: "Since the move to Ward 6A and 4B in September 2018, infection rates have been similar to other Scottish paediatric units.

"We have fully tested the water supply and ward surfaces in Ward 6A and also reviewed individual infections and found no links between individual infections and no source of infections in the ward.

"Families should be reassured that infection rates at present are within expected levels and the hospital is safe."

- 6.1.3 On 24 June 2020, in an online article titled “Doctors' safety concerns 'not taken seriously' at Glasgow hospital” (available at: <https://www.bbc.co.uk/news/uk-scotland-53165606>), it was reported that “[t]he health board said these issues have been investigated thoroughly. It said action had been taken and the hospital was safe.”

- 6.1.4 On 3 August 2021, a spokesperson for GGC was reported to have said (see “NHS whistleblower questions whether Glasgow super-hospital was safe to open”, The Daily Record, 3 August 2021 available at: <https://www.dailyrecord.co.uk/news/politics/nhs-whistleblower-questions-whether-glasgow-24671901>):

“We have listened to concerns that have been raised and have taken immediate, appropriate action to address these issues. As soon as we

became aware of potential risks with the water supply in 2018, swift action was taken. This included point of use filters for water outlets, chlorination treatment of the water supply, and ultimately the relocation of Wards 2A and B to another part of the hospital. In total, £6million was spent on addressing water supply issues, with a further £8million invested in Wards 2A and B, including a significant upgrade of the ventilation system.”

- 6.1.5 On 3 March 2022, in an online article titled “Child cancer wards to reopen after water bacteria fears” (available at: <https://www.bbc.co.uk/news/uk-scotland-60591848>), the BBC reported:

“NHS GGC said water in the hospital met all national standards and was safe to drink.

In addition, as is the case in all areas of the building, the water undergoes a process of filtration and regular dosing with chlorine dioxide.

And in places where the most vulnerable patients are cared for, such as Wards 2A and 2B, additional filters have been added to the taps.”

7. CONCLUSION

- 7.1 The above comments and questions build, not only on the findings made in the Walker Report, but also on the material referred to by Dr Walker in it. They are intended to allow Dr Walker to elaborate on matters which, in the view of Dr Peters (who is someone who has had day to day knowledge and experience of the system since the opening of the hospital in 2015 to date), are key to understanding the extent of the concerns about contamination of the water and waste system.
- 7.2 In relation to the above and the Walker Report more generally, Dr Peters would be happy to provide further input, information and/or clarification as required.

Helen Watts KC and Leigh Lawrie, Advocate

On behalf of Dr Christine Peters

12 June 2024



**Bundle of documents for Oral hearings commencing from 19 August 2024 in relation to the
Queen Elizabeth University Hospital and the Royal Hospital for Children, Glasgow**

Bundle 21 – Substantive Core Participants responses to Dr Walker Report

Volume 2

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