

Water Safety – Additional Sampling

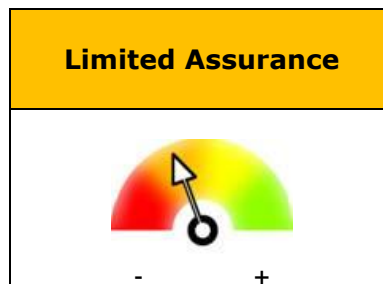
Final Audit Report

2019/20

Hywel Dda University Health Board

NHS Wales Shared Services Partnership

Audit and Assurance Services



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Please note:

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1. Introduction and Background

An audit of the systems and procedures operating within the University Health Board to ensure Water Safety was previously reported to the University Health Board in April 2019.

The aim of the original review was to evaluate supportive processes and procedures operating within the University Health Board to ensure compliance with the requirements of Welsh Health Technical Memorandum (WHTM) 04-01, Safe Water in Healthcare Premises.

The April 2019 audit determined an overall “**limited assurance**” in the areas reviewed (focussing on the **Glangwili** and **Prince Philip** Hospital sites).

The Audit Committee requested (at their meeting held in May 2019), that a further review be progressed, focussing audit testing at other UHB sites. Accordingly, **Withybush Hospital, and the two satellite sites** of St. Nons and St. Caradogs wards, were sampled at the current review.

The audit opinion determined within this report is restricted to the specific audit testing undertaken at these sites.

2. Scope and Objectives

The review was undertaken to determine the adequacy of, and operational compliance with, the systems and procedures of the UHB, taking account of relevant NHS and other supporting regulatory and procedural requirements, as appropriate.

The audit evaluated the systems and controls in place within the UHB with a view to delivering assurance to the Audit Committee that risks material to the objectives of the areas covered were appropriately managed.

Accordingly, the scope and remit of the audit was directed to the following areas:

- **Governance** - The Health Board had adequate arrangements in place to support the implementation of the approved code of practice. Also, that an appropriate policy was in place to address water safety issues, there were defined allocation of responsibilities, clear lines of communication and reporting and approval processes.
- **Procedures** - To ensure that management were implementing applicable procedures – both internal and external requirements.
- **Monitoring and Reporting** - To ensure that the estate was appropriately monitored. To ensure that the Health Board had

effective monitoring procedures in place e.g. the establishment of appropriate Water Safety Groups (WSGs). Assurance that there was appropriate record retention and dissemination of information through to the Executive team and Board.

- **Management** - Assurance that relevant staff received appropriate training, and appropriate resources were allocated. Assurance that an appropriate inspection / detection regime is operated.
- **Risk Management** - Assurance that the Health Board had performed a suitable and sufficient assessment of risks. Risks were appropriately managed.

3. Associated Risks

The potential risks considered in the review were as follows:

- Patient Safety;
- Prosecution / criminal negligence;
- Adverse publicity;
- Breach of regulations / Approved Code of Practice;
- Fines and defence costs;
- Ineffective / inappropriate governance arrangements;
- Ineffective / ill-informed management; and
- Ineffective risk control.

OPINION AND KEY FINDINGS

4. Overall Assurance Opinion

We are required to provide an opinion as to the adequacy and effectiveness of the system of internal control under review. The opinion is based on the work performed as set out in the scope and objectives within this report. An overall assurance rating is provided describing the effectiveness of the system of internal control in place to manage the identified risks associated with the objectives covered in this review.

A follow up review of the audit recommendations made at the April 2019 audit (focussing on the Prince Philip Hospital and Glangwili sites) has been reported separately. Positive action has been demonstrated addressing all of the recommendations made at the previous review.

The prime function of this audit was to evaluate the management and control arrangements at a selection of sites not included in the sample of the original audit.

Key differences from the prior audit may be summarised as:


- improved governance structures have been established, including the regular meetings of the Water Safety Group;
- the implementation of enhanced local procedures (following publication of a revised Water Safety Policy, and update of the associated Plan);
- there is a need to enhance monitoring and reporting arrangements (for the areas examined), to adequately inform the Water Safety Group; and
- Whilst a risk-based approach, as required by WHTM 04-01, has been implemented; this needs to be informed by updated schematic drawings.

Whilst **no** cases of legionella related illness were identified at the sampled sites (as defined by the Health and Safety Executive (HSE), **eleven** suspect / significant legionella water samples have been reported in the past twelve months at Withybush Hospital.

The key issue identified at the current review is the need to update the schematic drawings (particularly for the Withybush Hospital site noting the number of adverse reads), and then develop an associated risk based action plan to be able to proactively manage high-risk areas within the infrastructure and fully inform control measures thereafter.

Whilst acknowledging the same, until the schematic drawings and action plans have been completed, this remains a key risk. Our opinion has therefore been derived from the risks and controls in place during the period of audit.

Accordingly, noting these key assurance limitations, a **limited assurance** has been determined.

RATING	INDICATOR	DEFINITION
Limited Assurance		The Board can take limited assurance that arrangements to secure governance, risk management and internal control, within those areas under review, are suitably designed and applied effectively. More significant matters require management attention with moderate impact on residual risk exposure until resolved.





The overall level of assurance that can be assigned to a review is dependent on the severity of the findings as applied against the specific review objectives and should therefore be considered in that context.

Management advised that a project to update drawings was in progress at the time of our review. In the interim, recognition has been given to certain mitigating reactive arrangements in place notably:

- temperature and flow monitoring via a Building Management System;
- bacteria testing informed by temperature tests; and
- active monitoring and maintenance informed by the above (including removal of flow restrictors, flushing, use of filters; address issues with mixing values etc.).

5. Assurance Summary

The summary of assurance given against the individual objectives is described in the table below:

Assurance Summary					
1	Governance			✓	
2	Procedures				✓
3	Monitoring & Reporting		✓		
4	Management		✓		
5	Risk Management		✓		

* The above ratings are not necessarily given equal weighting when generating the audit opinion.

Design of Systems/Controls

The findings from the review have highlighted **two** issues that were classified as weaknesses in the system control/design for water safety.

Operation of System/Controls

The findings from the review have highlighted **nine** issues that were classified as weaknesses in the operation of the designed system/control for water safety.

6. Summary of Audit Findings

The key findings are reported within the Management Action Plan (**Appendix A**).

Governance



- To affirm that the Health Board had adequate arrangements in place to support the implementation of the approved code of practice.
- To affirm that an appropriate policy was in place to address water safety issues.
- To ensure that there were defined allocation of responsibilities, clear lines of communication and reporting and approval processes.

The availability of up-to-date guidance is key to managing Health & Safety (HSE) requirements and WHTM 04-01.

The UHB has:

- a current and appropriately approved Water Safety Policy;
- senior committees with escalation / notification procedures to inform the Executive;
 - (via both the Infection Prevention & Control Committee, and Health & Safety Committee - IPCC);
 - full papers of the Water Safety Group provided to the IPCC
- a Water Safety Group (WSG) of appropriate membership, attendance and meeting frequency; supported by
 - expert advice, including a micro-biologist, and an authorised engineer (NWSSP: Specialist Estates Services -SES);
 - appropriately trained staff and contractor certifications; and
 - external testing and inspection agencies including Welsh Water; together with
- roles and responsibilities defined at the Water Safety Policy and Plan;
 - both a Responsible Person (RP) and Deputy Responsible Person were in place, with allocated duties as required by the HSE Approved Code of Practice (ACoP) L8.

However, it is noted below (reporting) that there is a need to improve reporting, and hence information for scrutiny by the IPCC.

Noting the above, a **reasonable assurance** is determined in relation to governance.

Procedures



To ensure that management were implementing applicable procedures – both internal and external requirements.

As noted above, a revised Policy had recently been approved. The Water Safety Plan was approved by the Water Safety Group in July 2019 WSG and forwarded to NWSSP: Specialist Estates Services prior for additional comment.

Whilst noting the above, the inclusion of additional guidance within the Plan has been recommended to enhance their implementation, e.g. in relation to response times and definition of elevated contamination levels (**Recommendation 1**).

While noting the recommended enhancements a **substantial assurance** has been determined for this area.



Monitoring and Reporting

- *To ensure that the estate was appropriately monitored.*
- *To ensure that the Health Board had effective monitoring procedures in place e.g. the establishment of appropriate Water Safety Groups (WSGs).*
- *Assurance that there was appropriate record retention and dissemination of information through to the Executive team and Board.*

The audit observed controls in operation including:

- generally good record retention, and ease of retrieval;
- commissioning records (included detailed water specification, drawings, a document register, and biological testing records); and
- key issues arising were reviewed with relevant parties and summarised to the Water Safety Group.

Legionella issues were primarily communicated via email correspondence (acknowledging the need for timely communication), with narrative update to the Water Safety Group.

However, the Water Safety Group did not benefit from an appropriate range of reports (reflecting issues raised within this audit) to provide it with appropriate assurances and fully reflect all the work undertaken. These should be required to facilitate appropriate scrutiny (e.g. flushing reports, summary test findings, purification / remedial works, and flushing audits). They would also enhance reporting to superior committees, and evidence controls and preventative work to third parties in the event of an outbreak (**Recommendation 2**).

The need for greater on-site documentation relating to commissioning (**Recommendation 3**), and some additional record retention (to provide further WHTM 04-01 compliance), have also been recommended (**Recommendation 4**).

Noting the above, a **limited assurance** has been determined in respect of monitoring and reporting.

Management



- Assurance that relevant staff received appropriate training, and appropriate resources were allocated.
- Assurance that an appropriate inspection / detection regime is operated.

The audit observed controls in operation including:

- proactive monitoring, notably via dynamic reads of the Building Management System (BMS);
- trained staff and contractors;
- proactive measures applied e.g. flushing, temperature testing, shower maintenance and point of use filters; and
- active response to issues e.g. where temperature control parameters are exceeded, as part of a risk led approach; and
- corresponding maintenance schedules.

The Health and Safety Executive (HSE) define a Legionella outbreak as:

"two or more cases where the onset of illness is closely linked in time (weeks rather than months) and where there is epidemiological evidence of a common source of infection, with or without microbiological evidence" HSG274 Part 2 (Appendix 2.3).

No cases of legionella related illness were identified at the sampled sites (as defined by the Health and Safety Executive (HSE)).

However, over the last year, eleven suspect / significant legionella water samples were reported:

- two in December 2018 (Ambulatory Unit, and one in the Cardiovascular Unit);
- one in February 2019 in the Post Graduate Hot Water supply; and
- eight "suspect" results in August 2019 (two in Medical Records and six in the intensive care unit - ITU). Following further tests, four were stated as positive, but subsequently all have been classified as negative, following remedial measures.

Management have highlighted that the identification of the above was directed by adverse temperature readings (i.e. outside control parameters). As such, they point to the active implementation of controls together with a range of remedial actions mitigating risk.

However, WHTM 04-01 requires accurate infrastructure drawings and information to inform appropriate and targeted management. While we evidenced current work to achieve this goal, it remains ongoing. This means that discovery of “dead legs” / risks within the configuration also remains ongoing. (**Recommendations 5 & 6**).

The potential need for investment in the Building Management System (BMS) within Withybush was also highlighted to us, noting it should provide a fuller range of controls (in accordance with WHTM 04-01) (**Recommendation 7**).

Additionally, at some of the areas tested, staff were unclear as to whether flushing responsibilities rested at departmental level or with Estates staff (with the risk that neither party undertake these duties) (**Recommendation 8**).

In summary, while active monitoring and maintenance was observed, noting the need for more targeted and informed controls, a **limited assurance** is presently determined in this area.

Risk Management



Assurance that the Health Board had performed a suitable and sufficient assessment of risks and that risks were appropriately managed.

The UHB adopts a risk-based approach to the control of legionella and pseudomonas, in accordance with WHTM 04-01. In particular:

- linkage was established between temperatures outside control parameters and Legionella testing;
- infrastructure / control issues, have resulted in review and reconfiguration projects; and
- there was a current and approved UHB wide risk assessment.

However, as noted, both WHTM 04-01, and associated Health and Safety guidance, require accurate infrastructure drawings to inform site based risk assessments.

This may particularly affect the assessment of risks in augmented care areas, where the UHB risk assessed policy is not to routinely test for legionella. The local operational application / assessment may not therefore be appropriately informed at the Withybush site i.e. more accurate information may better direct application of resources (**Recommendation 9**).

We additionally observed enhance risk assessment in relation to:

- reporting accepted risks (**Recommendation 10**); and
- the need to confirm that outstanding actions relating to external reviews have been completed, including Welsh Water infringement notices (3 remaining of 80) (**Recommendation 11**).

In conclusion, risk mitigations in accordance with the UHB risk assessment, and were largely those expected by infection control guidance. However, they were not effectively informed by operational risk assessments (pending up drawing updates). Accordingly, a **limited assurance** has presently been determined in this area.

7. Summary of Recommendations

The audit findings, recommendations are detailed in **Appendix A** together with the management action plan and implementation timetable.

A summary of these recommendations by priority is outlined below:

Priority	H	M	L	Total
Number of recommendations	2	7	2	11

Governance and Management

Finding 1: Procedural guidance	Risk
<p><u>Elevated levels¹</u></p> <p>WHTM 04-01 Part B comments that: <i>"Two factors determine the number of bacteria deeply inhaled:</i></p> <ul style="list-style-type: none"><i>• the concentration of bacteria; and</i><i>• the duration of exposure."</i> <p>To summarise; legionella levels can be:</p> <ul style="list-style-type: none">• High / significant;• Medium;• Low / negligible / nil. <p>While readings inspected by the audit were in the High or Low categories, there can also be interim readings.</p> <p>Long-term low-level exposure is therefore also a factor to be considered. Guidance on what constituted elevated levels was not contained within the Water Safety Plan.</p> <p><u>Response times¹</u></p> <p>Similarly, appropriate reaction times for infrastructure works were not specified at the Water Safety Plan.</p>	<p>Procedures do not provide sufficient guidance.</p>

<p><u>Flushing durations</u></p> <p>The Water Safety Policy states, “<i>The UHB must effectively communicate good working practice of water management principles</i>” and “<i>water flushing regimes.</i>”</p> <p>However, the Water Safety Plan did not provide guidance on the definition of infrequently used, or duration of flushing for particular areas and facilities.</p> <p>¹ <i>Examples of good practice from another UHB is attached at Appendix C.</i></p>	
<p>Recommendation 1</p>	<p>Priority level</p>
<p>Within the Water Safety Plan, management should strengthen the:</p> <ul style="list-style-type: none"> (a) definition of elevated levels; (b) response times for infrastructure works; (c) definition of infrequently used outlets; and (d) clarification of durations of flushing. (D) 	<p>Low</p>
<p>Management Response</p>	<p>Responsible Officer/ Deadline</p>
<p>Agreed.</p> <p>The water safety plan will be reviewed and updated to reflect the actions identified.</p>	<p>Head of Operational Facilities Management <i>in co-ordination with</i></p> <p>Senior Nurse Infection Prevention /</p> <p>December 2019</p>

Monitoring and Reporting

Finding 2: Reporting	Risk
<p>The Water Safety Plan describes the role of the Water Safety Group (WSG) as having:</p> <p><i>“collective and individual responsibilities for the safe provision and use of water”.</i></p> <p>The Water Safety Policy states that the Responsible Person for Water Safety (RPW) shall:</p> <p><i>“Submit a status report six monthly to the Water Safety Group, which can be circulated to the Infection Prevention Sub Committee, which shall include:</i></p> <ul style="list-style-type: none"> <i>• compliance audit on ward flushing regimes of infrequently used outlets and monitor requests for removal of outlets;</i> <i>• review of PPM (Pre Planned Maintenance) regimes to ensure that they are appropriate and are being carried out; and</i> <i>• review PPM omissions, analyse reasons for omissions and include in the status report”.</i> (Further details at Appendix F). <p>The audit found:</p> <ul style="list-style-type: none"> proactive measures applied e.g. flushing, temperature testing, shower maintenance and point of use filters; and 	<p>Responsible parties are not appropriately informed.</p>

- active response to issues e.g. where temperature control parameters are exceeded, as part of a risk led approach; and
- corresponding maintenance schedules.

However, it did not find an appropriate range of reporting to reflect the positive action being taken. While we understand that many issues are reported on an exception basis, there is scope for the WSG to be more effectively informed in relation to:

- Pseudomonas & legionella test results etc.;
- Showers (heads / hoses) servicing;
- Completion of audits (flushing / servicing etc.); and
- Maintenance (including not only mechanical, electrical and inspection work, but work relating to filters, and flow restrictors etc.).

It is appreciated that management are generally well informed¹. However, such holistic and summary reporting is essential to provide evidence to third parties of the operation of controls and preventative work undertaken. In the event of incidents or outbreaks, such records would be key documents. They can also act as summary documents to superior committees, and enhance the assurance and scrutiny of the Water Safety Group.

(Further details at **Appendix F**).

¹ Since commencement of audit fieldwork a meeting convened to address issues within ITU contained clear reporting of legionella issues, though replication of this reporting to the Water Safety Group was not evidenced.

Recommendation 2	Priority level
<p>a) Reports should be presented to the Water Safety Group to provide it with appropriate assurances, and to facilitate scrutiny in accordance with its role (including flushing, maintenance, management audit, summary test findings, and purification / remedial works).</p> <p>b) Reporting of infrequently used outlets should include nil declarations. (O)</p>	<p>Medium</p>
Management Response	Responsible Officer/ Deadline
<p>Agreed.</p> <p>We will review current reporting arrangements and the information presented to the Water Safety Group.</p> <p>Enhanced management reports will be developed and presented to the Water Safety Group for information/ consideration (including the areas identified at the current review).</p>	<p>Head of Operational Facilities Management</p> <p>December 2019</p>

Finding 3: Commissioning	Risk
<p>The Water Safety Plan requires:</p> <ul style="list-style-type: none"> • “Design assessment – <i>All water system designs are subjected to a design risk assessment before construction commences where a schematic drawing of the water system and performance criteria (volume, flow, temperatures and other relevant controls) are reviewed and assessed by appointed Capital and Operational RP (Water) and/or the Authorising Engineer (Water), and a representative of IPC”</i> <ul style="list-style-type: none"> ○ i.e. Risk assessment – evidence of review of parties; and • “Commissioning testing – <i>WSP Extract “Performance of the water system in line with design criteria must be proved and witnessed by or on behalf of the RP (Water) and/or Authorising Engineer (Water) during the commissioning process and before the project is handed over. Records of commissioning are issued as part of the Health & Safety Manual or Operation & Maintenance Manual”.</i> <ul style="list-style-type: none"> ○ i.e. evidence of witness & records of commissioning <p>The audit sought to sample the above in relation to the recent Ward 9 refurbishment at Withybush.</p> <p>Specification, drawings and a document register were supplied, together with externally commissioned biological testing of the supply. However, neither design risk assessment nor performance testing were evidenced. It was also noted that</p>	<p>Unrecognised risks and issues are introduced by new infrastructure.</p>

these records were not available at the local site from the Responsible Person for Water.	
Recommendation 3	Priority level
Commissioning records should be available locally including design risk assessment and performance testing. (O)	Medium
Management Response	Responsible Officer/ Deadline
<p>Agreed.</p> <p>Management will review the processes applied at the recent Ward 9 refurbishment at Withybush and provide feedback to the water Safety Group.</p> <p>Commissioning Records will be available locally (for the Responsible Person).</p>	<p>Head of Operational Facilities Management</p> <p>December 2019</p>

Finding 4: Record retention	Risk
<p>The Water Safety Policy states that:</p> <p><i>"Records will be kept...for a minimum of five years".</i></p> <p>Records were identified in relation to:</p> <ul style="list-style-type: none"> • Chlorination; • Legionella test results; • Pseudomonas test results & augmented area test plan; • Temperature tests; • planned maintenance; • BMS monitoring; • Shower hose / head work; • Risk assessments & reports; • Action logs; • Training records including evidence of contractor training; and • 5-year record retention evidenced in accordance with procedures. <p>However, there were no records of cold-water tank inspections and cold-water insulation in accordance with HTM 04-01 Part B.</p>	<p>Inadequate record retention exposes management to liabilities.</p>
Recommendation 4	Priority level
<p>(a) Records of inspections should be retained in accordance with HTM 04-01 Part B.</p>	<p>Medium</p>

(b) Relevant inspections should be reported at appropriate intervals to the Water Safety Group. (O)	
Management Response	Responsible Officer/ Deadline
Accepted. All inspection records will be retained in accordance with HTM 04-01 Part B.	Head of Operational Facilities Management December 2019

Finding 5: Schematic drawings	Risk
<p>WHTM 04-01 states that:</p> <p><i>“The Water Safety Group should ensure that estates and facilities staff have up-to-date accurate records and drawings/ diagrams showing the layout .. of the whole water system” (5.13).</i></p> <p>The site risk assessment / survey (as most recently commissioned in 2015) stated:</p> <p><i>“There is currently an A3 file of as built drawings. Refurbishments are ongoing. We recommend that controls are implemented to ensure that the file of drawings is kept up to date”.</i></p> <p>Following multiple discoveries of Legionella within the Intensive Care Unit in August 2019, an Outbreak Control Meeting (23rd Aug) minuted:</p> <p><i>“Disinfection is carried out by an outside company. This procedure is currently not possible as we do not have complete schematic drawings for pipework in the area and cannot be certain that we could identify all outlets”.</i></p> <p>There are therefore long-standing and ongoing issues relating to this key compliance with WHTM 04.</p> <p>Up to date drawings are required to identify dead legs (a key cause of build-up of bacteria), and programme their removal. They also identify other issues such</p>	<p>Non-compliance with WHTM 04-01.</p> <p>Risk appraisals are not appropriately informed.</p> <p>Corrective actions are not appropriately informed.</p>

as proximity of hot and cold water pipes for potential heat transfer issues, location of thermostatic mixing valves (TMV's) etc¹.

At the time of audit, completion (by area) was stated to be:

- Incomplete drawings total 35%
- Drawings Underway 39%
- Completed 26% (see **Appendix D** for further details)

With reference to these figures, the West Site Operational Manager stated (on 12th September 2019) *"in essence we have, 65% accurate or nearly accurate within weeks"*.

In April 2018, the Royal United Hospitals Bath NHS Foundation Trust was fined £300,000 for a legionella related death. The HSE inspector stated:

"RUH had measures in place to prevent and control the risk to its patients from exposure to legionella from its water systems, but these were ineffective due to the Trust not having accurate knowledge of the layout of those water systems."

The fact that the issues had persisted and not been recognised for some 6 years was also cited. The adverse publicity of this case for the Bath RUH is also noted.

In the case of Withybush Hospital, the 2015 recommendation is now some 4 years extant. However, we were advised that the low likelihood of an unknown sub-loop together with the monitoring and mitigation work undertaken that there is unlikely to be at comparable risk at Withybush.

<p>It was noted that the discovery of elevated levels of legionella within ITU was prompted by active temperate testing (yielding temperatures outside control parameters).</p> <p>¹ <i>Issues with thermostatic mixing values are a known and regular cause of water temperatures varying outside control parameters.</i></p>	
<p>Recommendation 5</p>	<p>Priority level</p>
<p>Management should address recommendation 2 of the 2015 Withybush Hospital site survey (in accordance with WHTM 04) i.e. that “controls are implemented to ensure that the file of drawings is kept up to date.” (O)</p>	<p>High</p>
<p>Management Response</p>	<p>Responsible Officer/ Deadline</p>
<p>Agreed.</p> <p>This is a known and reported risk (included within Datix).</p> <p>Work is currently proceeding to address this issue with a specific funding allocation provided to provide complete schematic drawings of the Withybush site in 2019/20. It is anticipated that further funding will be required to in 2020/21 to complete this exercise.</p> <p>We would welcome a further audit review of progress during Q4 2019/20 to evaluate progress.</p>	<p>Head of Operational Facilities Management</p> <p>On receipt of the schematic drawings, an action plan will be developed to address/manage the identified high-risk areas to allow us to define an accurate timeline in Q4 2019/20.</p>

Finding 6: Labelling of pipework	Risk
<p>The Water Safety Plan requires “<i>clear labelling of pipework</i>” (reflecting requirements within HTM 04-01 Part C 3.1n).</p> <p>Such labelling was not evidenced at Withybush and the satellite sites.</p> <p>However, it is recognised that full retrospective labelling in an operational hospital may present practical issues (e.g. dust contamination / infection control, and decant / cost requirements). Accordingly, it is appreciated that a practical view should be taken, appropriately informed by risk assessment.</p> <p>Additionally such labelling should be maintained on an ongoing basis in refurbished / new build areas and in accessible areas such as plant rooms (as separately required by the WHTM).</p>	<p>Non-compliance with WHTM 04-01, and UHB procedures.</p> <p>Unrecognised risk.</p>
Recommendation 6	Priority level
<p>The Water Safety Plan should be updated to accurately reflect requirements and the UHB’s approach to pipework labelling. (O)</p>	<p>Medium</p>
Management Response	Responsible Officer/ Deadline
<p>Agreed.</p> <p>The Water Safety Plan will be updated to accurately reflect requirements and the UHB’s approach to pipework labelling i.e.</p> <ul style="list-style-type: none"> all pipework will be labelled at newly commissioned projects; and 	<p>Head of Operational Facilities Management</p> <p>December 2019</p>

- | | |
|--|--|
| <ul style="list-style-type: none">• any high-risk areas identified from the current schematic update process will be appropriately labelled. | |
|--|--|

Finding 7: Building Management System	Risk
<p>The BMS at Withybush currently provides dynamic (and historic) outflow and return temperatures for the prime feed pipes. This adds considerably as a control measure. It has been utilised to identify sudden or significant temperature variations, and enabled timely corrective action e.g. when a pump failed. It was also relied upon to record the maximum and minimum temperatures of storage tanks (a task which otherwise requires discrete testing under HTM 04-01).</p> <p>Noting that temperature tests were not undertaken at points intermediate to the sentinels (as strictly required by HTM 04-01), this provides a valuable compensating control. However, there were several major sub-loops, which can have temperatures at variance to the major loops. Noting this, there may be considerable benefit in enhancing the abilities of the BMS, notably to additionally monitor sub-loops.</p> <p>A death at the Bath RUH was linked to issues with a sub-loop, which had not been identified or effectively monitored. The HSE inspector stated:</p> <p><i>“The investigation revealed that the annex to the William Budd Ward is on a separate loop of the hospital’s water system to that which supplies the main ward. This important fact had not been recognised by the Trust from the opening of the annex in 2009 until Mr Brooks’ death in July 2015. This failure meant the required temperature checks and tests for the presence of legionella bacteria in the water had not been carried out in the annex over this period.”</i></p>	<p>Compensating controls not effectively / fully utilised.</p>

<p>We understand that an upgrade is currently proposed to the BMS and that a more comprehensive system is being assessed.</p> <p>The Authorised Engineer report of December 2018 (at recommendation F3) in examining whether outflow¹ and return temperatures are monitored, noted that this was recorded by the BMS at Withybush, but not at other sites.</p> <p>¹ Calorifier output (outflow)</p>	
Recommendation 7	Priority level
Management should review the cost / benefit of an enhanced BMS provision. (D)	Medium
Management Response	Responsible Officer/ Deadline
<p>Agreed.</p> <p>We will review the cost / benefit of an enhanced BMS at the Water Safety Group.</p>	<p>Head of Operational Facilities Management</p> <p>March 2020</p>

Finding 8: Flushing responsibilities	Risk
<p>The Water Safety Plan states:</p> <p><i>"Daily cleaning and flushing is undertaken by the user department."</i></p> <p>A walk around review of flushing of infrequently used outlets was undertaken with the Responsible Person Water (RPW). Robust records of flushing were generally being maintained.</p> <p>However, there were three instances where relevant records were not maintained¹. Departmental staff in these areas were unclear as to whether flushing responsibility rested with them or domestic staff.</p> <p>¹ <u>Note</u></p> <p><i>Sampled areas included:</i></p> <ul style="list-style-type: none">• <i>Withybush Hospital;</i>• <i>St Caradogs; and</i>• <i>St. Nons Day Hospital</i> <p><i>At Withybush Hospital, the critical care areas of Cancer Day Ward, and Intensive Care were selected, along with the Midwifery Led Unit (MLU), Puffin Ward (childrens ward); and Dental. These latter three being areas identified as having infrequently used water supply (and hence considered by the audit to be higher risk for legionella and pseudomonas).</i></p>	<p>Essential tasks are not performed / performed appropriately.</p>

<u>Testing detail</u>				
Area	Flushing records?	Comprehensive?	Audit Comments	
St Nons	Y	Y		
St Caradogs	N		Advised no infrequently used outlets	
Cancer Day Ward	Y	Y		
Intensive Care	N		Advised no infrequently used outlets	
MLU	N	N	Storeroom outlets not brought into use – not flushed. Spare room including sink, disconnected shower and toilet. Sink and toilet stated to be flushed but no records. Following inspection - these latter two rooms stated by management have been disconnected.	
Puffin Ward	N	N	A spare room did not contain a flushing sheet.	
Recommendation 8				Priority level
Flushing responsibilities should be clarified. (O)				Low
Management Response				Responsible Officer/ Deadline
Agreed.				Head of Operational Facilities Management <i>in co-ordination with</i>

The responsibilities for cleaning and flushing of infrequently used outlets has recently been reiterated via a global email.

We will liaise further with the associated departments to ensure that appropriate actions are taken and records maintained (i.e. ensuring relevant sheets are appropriately signed and completed), for the cleaning and flushing of infrequently used outlets.

Senior Nurse Infection Prevention /
December 2019

Risk Management

Finding 9: Configuration risk assessment	Risk
<p>WHTM 04-01 states that:</p> <p><i>"The risk assessor(s) should be given access to competent assistance from the client. This may be in the form of as-fitted drawings and schematic diagrams" to enable "engineering assessment of water systems".</i></p> <p>This accords with HSE guidance (HSG274 part 2) which states:</p> <p><i>"The risk assessment should consider and evaluate: a description of the water system, including an up-to-date schematic diagram" and that: "The practical risk assessment should include a site survey of all the water systems."</i></p> <p>The Water Safety Policy also requires <i>"regular Risk Assessment Reviews on all water systems"</i>.</p> <p>The UHB adopts a risk-based approach to the control of legionella and pseudomonas, in accordance with WHTM 04-01. In particular:</p> <ul style="list-style-type: none"> • linkage was established between temperatures outside control parameters and Legionella testing; • infrastructure / control issues, have resulted in review and reconfiguration projects; and 	<p>Non-compliance with WHTM 04-01.</p> <p>Risk appraisals are not appropriately informed.</p> <p>Corrective actions are not appropriately informed.</p>

- there was a current and approved UHB risk assessment.

However, while there were extensive reports relating to water issues and actions to the WSG, these reports did not link to re-assessment of infrastructure risk.

The externally commissioned site survey (commissioned in 2015 to assess system risks) was not informed by accurate configuration information (**finding 5**). It is noted that augmented care areas may therefore exhibit particular infrastructure issues (prevalence of dead legs etc.).

We understand that the “Hywel Dda UHB Water Safety Risk Assessment Form” (as refreshed in April 2019) defines a risk policy approach for the UHB. It states that *“If any control measures fail. Undertake a further Risk Assessment of the individual circumstances”* i.e. at specific locations.

While this current legionella risk assessment was available, this was for the UHB as a whole, and not individual sites or areas.

While there were multiple discoveries of Legionella at Withybush, during the period of audit, no (further) site based risk assessments were evidenced. We understand that these were verbal / informal appraisals at the Water Safety Group, and newly convened Outbreak Control Team Meeting.

The various sites suffer / benefit from differing infrastructure provisions, and therefore give rise to differing risk profiles.

Accordingly, location specific risk assessments have not to date been fully informed of the infrastructure in accordance with the WHTM / HSE requirements.

<p>It is noted that such information may better direct resources e.g. removal of dead legs, direct remedial works, and which sub loops are subject of additional BMS monitoring – finding 7).</p>	
<p>Recommendation 9</p>	<p>Priority level</p>
<p>Location specific risk assessments should be accurately informed in relation to the infrastructure / configuration in accordance with the WHTM / HSE requirements. (O)</p>	<p>High</p>
<p>Management Response</p>	<p>Responsible Officer/ Deadline</p>
<p>Agreed.</p> <p>Operational / infrastructure risks will be periodically re-appraised, as informed by additional infrastructure information and update.</p>	<p>Head of Operational Facilities Management</p> <p>December 2019</p>

Finding 10: Accepted risks	Risk
<p>While the UHB Water Safety risk assessment was submitted to the Water Safety Group, relevant factors relating to the control environment were not additionally reported.</p> <p>Matters not conducted fully in accordance with WHTM guidance included:</p> <ul style="list-style-type: none">• flushing / purging of expansion vessels not undertaken / reported in accordance with HSG274 (Authorised Engineer report Dec 18 Red action E13);• calorifiers not inspected;• no testing of intermediate sentinels; and• no reporting of steam decontamination and associated testing.	<p>Non-compliance with WHTM 04-01, and UHB procedures.</p> <p>Unrecognised risk.</p>
Recommendation 10	Priority level
<p>Accepted risks should be reported at the approval of risk assessments. (O)</p>	<p>Medium</p>

Management Response	Responsible Officer/ Deadline
Agreed. Enhanced management reports will be developed and presented to the Water Safety Group for information/consideration.	Head of Operational Facilities Management January 2020

Finding 11: External reviews & Infringement notices	Risk
<p><u>Infringement notices</u> Welsh Water following an inspection of Withybush Hospital in January 2018 issued 80 infringement notices. Management action logs now show only three outstanding. We have been informed that the remainder are due to conclude by mid-October 2019.</p> <p><u>Authorised Engineer Report</u> A report by the Authorised Engineer (NWSSP: SES), undertaken in December 2018, raised 58 recommendations. Of these, 24 were designated as actioned (as of April 2019).</p> <p>Of those outstanding, several relate to key issues identified by this audit including:</p> <ul style="list-style-type: none"> • B2 – detailed risk assessments (none noted for Pseudomonas); • B4 - need to action the recommendations of the 2015 site survey risk assessment (e.g. drawing update – recommendation 2); • C3 – need to update schematic drawings; • D6 – need to identify dead legs; • E3 – removal of redundant pipework; • E8 – evidence of quarterly cleaning and descaling de-scaling of shower hoses and shower heads; • E10 – evidence of inspection of tanks and calorifiers; • E12 – pipework insulation inspection; • E13 – Flushing and purging of expansion vessels. 	<p>The UHB is exposed to penalties / prosecution / prohibition notices.</p> <p>Adverse publicity.</p> <p>Contaminated supplies.</p>

Recommendation 11	Priority level
<p>Management should confirm that agreed recommendations of external reviews have been actioned, including those of;</p> <ul style="list-style-type: none"> the Authorised Engineer; Welsh Water (infringement notices); and site survey risk assessment. (O) 	<p>Medium</p>
Management Response	Responsible Officer/ Deadline
<p>Agreed.</p> <p>The Welsh Water infringement notices will be concluded by November 2019, with longer time frames required for certain others (noting that some NWSSP: SES recommendations relate to removal of redundant pipework following accurate drawings). Time frames for these are as advised at recommendations 5 & 6.</p>	<p>Head of Operational Facilities Management</p> <p>March 2020</p>

Audit Assurance Ratings



Substantial assurance - The Board can take **substantial assurance** that arrangements to secure governance, risk management and internal control, within those areas under review, are suitably designed and applied effectively. Few matters require attention and are compliance or advisory in nature with **low impact on residual risk** exposure.



Reasonable assurance - The Board can take **reasonable assurance** that arrangements to secure governance, risk management and internal control, within those areas under review, are suitably designed and applied effectively. Some matters require management attention in control design or compliance with **low to moderate impact on residual risk** exposure until resolved.



Limited assurance - The Board can take **limited assurance** that arrangements to secure governance, risk management and internal control, within those areas under review, are suitably designed and applied effectively. More significant matters require management attention with **moderate impact on residual risk** exposure until resolved.



No Assurance - The Board has **no assurance** that arrangements to secure governance, risk management and internal control, within those areas under review, are suitably designed and applied effectively. Action is required to address the whole control framework in this area with **high impact on residual risk** exposure until resolved.

Prioritisation of Recommendations

In order to assist management in using our reports, we categorise our recommendations according to their level of priority as follows.

Priority Level	Explanation	Management action
High	Poor key control design OR widespread non-compliance with key controls. PLUS Significant risk to achievement of a system objective OR evidence present of material loss, error or misstatement.	Immediate*
Medium	Minor weakness in control design OR limited non-compliance with established controls. PLUS Some risk to achievement of a system objective.	Within One Month*
Low	Potential to enhance system design to improve efficiency or effectiveness of controls. These are generally issues of good practice for management consideration.	Within Three Months*

* Unless a more appropriate timescale is identified/agreed at the assignment.

Appendix C – Example Elevated levels & Reaction times –

Good practice examples

Water Sample Results Criteria

<u>PARAMETER</u>	<u>SET POINT</u>
Biological Contamination	
Legionella Bacteria <100 cfu/litre	Growth Is Insignificant
Legionella Bacteria >100 but <1000 cfu/litre	Growth is Significant
Legionella Bacteria >1000 cfu/litre	Growth is Highly Significant
For Drinking Water	
T.V.C. Total Viable Count <5% Increase on normal site T.V.C	Growth is Insignificant
T.V.C. Total Viable Count 5-10% Increase on normal site T.V.C	Growth is Significant
T.V.C. Total Viable Count >10% Increase on normal site T.V.C	Growth is Highly Significant

Elevated Sample Procedure

Where there are elevated samples reference should be made to Appendix 2: Flow chart for Elevated Samples (*audit note - not included here*). The following should be read in reference to the above table noting only some of the recommendations are applicable to the item mentioned above.

Insignificant

- 1) No further action required, maintain current monitoring regime. In healthcare, the primary is protected and susceptible patients so any detection should be investigated and if necessary, the system re-sampled to aid interpretation of results. in line with the monitoring strategy and the risk assessment

Significant

- 1) Clean, de-scale and disinfect all removed showerheads and outlets and replace onto system immediately following disinfection.
- 2) Carry out a system clean and disinfection (within 2 days of results) and re-sample after 4 days from disinfection.
- 3) If result persists, repeat de-scale, clean and disinfection and re-sample after 4 days from disinfection.
- 4) If the result persists, follow procedures described in the Highly Significant section below.
- 5) Consider the source of contamination.

Highly Significant

- 1) Isolate system and carry out a system clean disinfection immediately or at least before the system is used again. Re-sample after 4 days from disinfection.
- 2) Remove all showerheads in contaminated area until post-disinfection biological analysis indicates the removal of contamination.
- 3) Clean, de-scale and disinfect all removed showerheads and replace onto system when post-disinfection biological analysis indicate the removal of contamination. Ensure that showerheads are in a dry state while disconnected to prevent stagnation.
- 4) Where showers are required to remain in use following indication, they shall be fitted with a suitable point of use filter to enable continued use of the facility. Where such filters are fitted, they should be changed according to manufacturer's instructions.
- 5) If the result persists, repeat system clean and disinfection, re-sample after 2 days from disinfection, and reconsider sources of contamination.

Outbreak Procedure

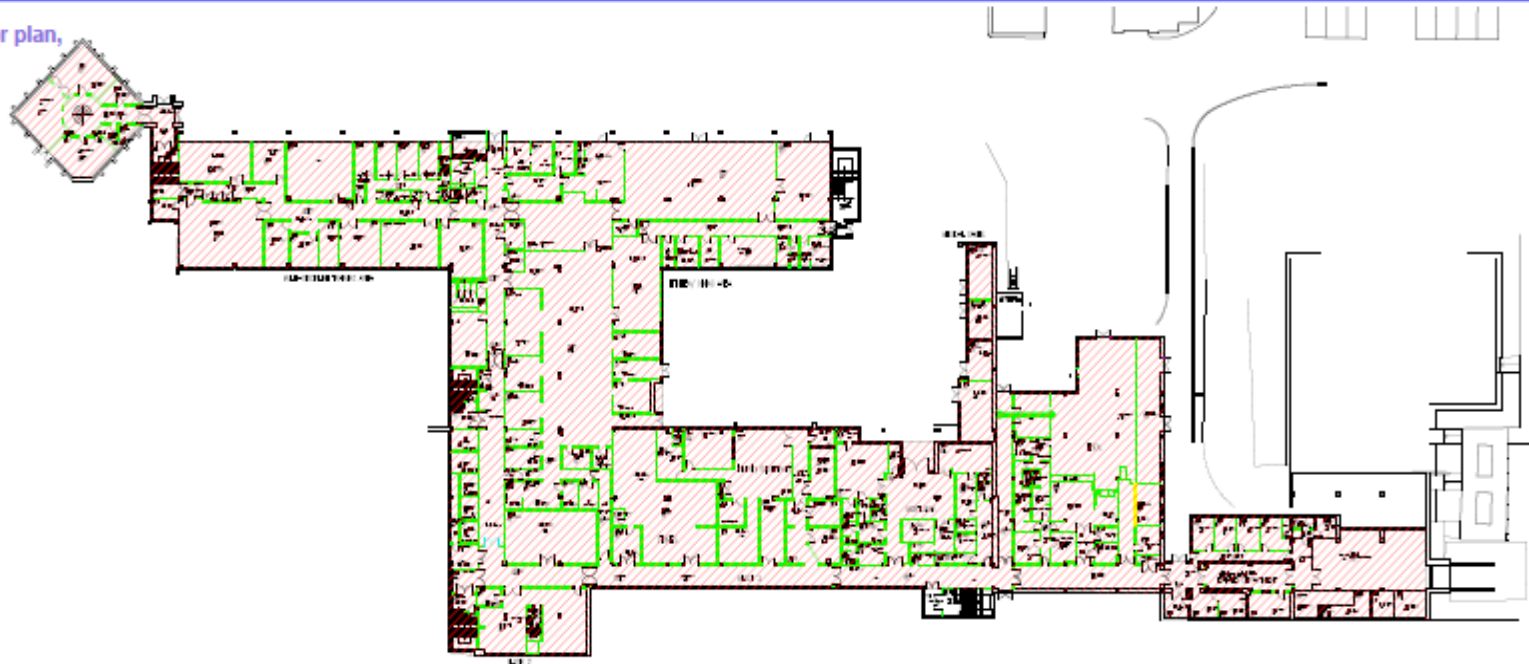
Please note: this Outbreak Procedure is not to be confused with the Elevated Sample Procedure described on the above pages.

Fault Rectification Periods.




Fault Reported	Time-Scale for Reporting of Fault	Time-Scale for Remedial Works
Biological analysis results reported as being outside the recommended limits at the outlet (on notification from laboratory). <i>(Refer to the table above for normal expected readings).</i>	Same-day	24 hours
ClO ₂ (Chlorine Dioxide) levels below recommended limits.	Same-day	24 hours
Calorifiers requiring disinfection due to biological contamination.	Same-day	48 hours
Fault Reported	Time-Scale for Reporting of Fault	Time-Scale for Remedial Works
Tanks requiring disinfection due to biological contamination.	Same-day	Tanks isolated within 48 hours
Tanks requiring disinfection due to excessive sediment presence.	Same-day	Within 1 Month
Whole system requiring disinfection.	Same-day	48 hours
Tanks/Calorifiers requiring refurbishment/upgrading.	24 hours	Within 3 months

Lower floor

Master Lower floor plan,



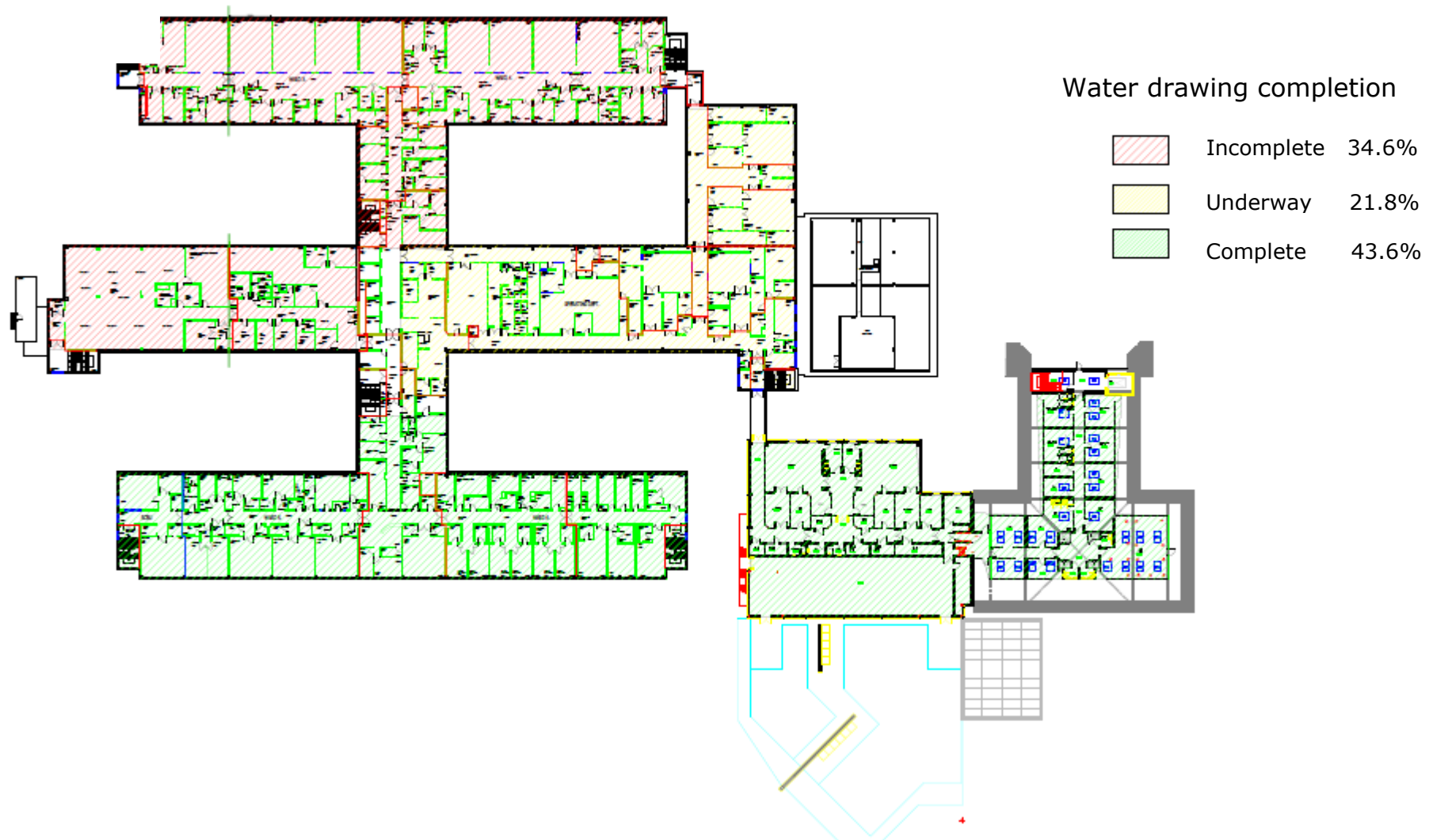
Water drawing completion

	Incomplete	100%
	Underway	0%
	Complete	0%

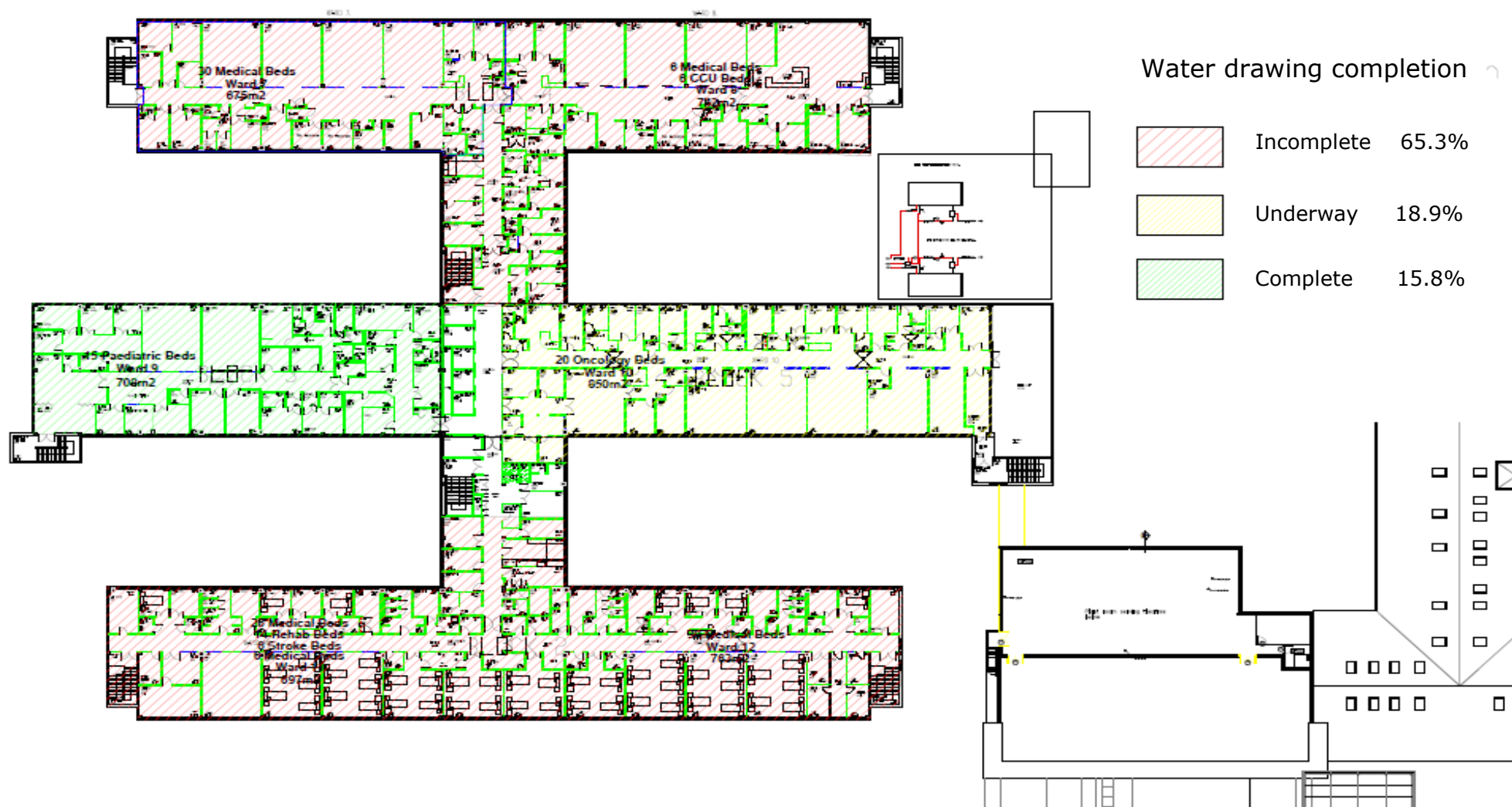
Water Drawings Completion

Incomplete	18%
Underway	60.9%
complete	21.1%

First Floor



Second Floor



Appendix E - Key observations comparison (Audit April 2019 versus September 2019)

Topic	April 2019 Audit (Glangwili &PPH)	Current Audit (Withybush + 2 satellites)
Governance	Need to fill certain roles	Appropriate roles appointed.
Procedures	Need to update / approve Policy and Plan	Policy and Plan updated, but further enhancement recommended.
Monitoring and Reporting	Significant record retention issues	Some record retention issues
Management	Need to monitor incomplete maintenance tasks	Incomplete tasks effectively monitored (but need to enhance reporting)
	Reporting of key issues satisfactory	Need for an appropriate range of reports to WSG to support issues raised at the current audit.
	Need to update training and confirm appropriate arrangements	Appropriate training and training arrangements
	An action plan to address the newly published NWSSP: SES report (which included recommendation for drawing update).	Action plan completed
	Actioning of above recommendations n/a noting date of report	Need to address outstanding third party recommendations including drawing update.
Risk Management	Need to confirm UHB risk policy	UHB risk policy confirmed
	Issue included above (actioning or prior recommendations).	Need for operational risks to be informed by updated drawings – <i>(separately highlighted at this report noting particular issues at Withybush Hospital).</i>

Appendix F

Reporting – Additional information and findings

Maintenance

The Water Safety Policy states that the Responsible Person for Water Safety (RPW) shall:

"Submit a status report six monthly to the Water Safety Group, which can be circulated to the Infection Prevention Sub Committee, which shall include:

- review of PPM (Pre Planned Maintenance) regimes to ensure that they are appropriate and are being carried out; and*
- review PPM omissions, analyse reasons for omissions and include in the status report.*

The Water Safety Plan requires that:

"Where checks...identify non-compliances, the departmental representative shall ensure that appropriate follow up action is taken in accordance with the risk posed, and records of all corrective action retained".

Reporting of maintenance included:

- detailed maintenance and inspection listings;
- general update of issues and activities;
- email progress updates; and
- verbal update of water issues at the Water Safety Group.

However, the former listings were submitted to the Operations Delivery Meeting, as part of updates relating to all performance within the UHB.

Accordingly, water specific and summary reports to either the Water Safety Group or the Infection Prevention Sub-Committee were not identified.

Legionella

While legionella was reported / narrated via minutes, there was no report of coverage and findings over time detailing levels found etc.

Similarly, no reporting was found of pseudomonas cleaning, swabbing or findings.

Showers

HTM 04-01 Part B requires shower servicing to:

"Dismantle, clean, descale and disinfect removable parts, heads, inserts and hoses where fitted..quarterly or as indicated by the rate of fouling or other risk factors, e.g. areas with high-risk patients".

While it was evident that cleaning of showerheads was undertaken on a cyclical basis, and a report produced, reporting to the WSG, including showerhead replacement, was not evidenced. We were informed that such reports are by exception.

Flushing

A public enforcement notice was served by the HSE to another NHS Wales UHB in November 2016 stating:

"You have not ensured that infrequently used hot and cold water outlets have been identified on a weekly basis within the UHB, and ensured that suitable and sufficient management arrangements are in place to ensure that infrequently used outlets are being flushed through on a weekly basis."

To facilitate compliance with such requirements, there was a need to report identification and flushing of infrequently used outlets to the WSG.

No flushing records were provided from the Intensive Care Unit (ITU), as it was advised that there were no infrequently used outlets. Following identification of elevated levels of legionella in the ITU water samples during the audit, it was subsequently determined that this was not the case.

Purification / remedial works

While a certificate of Chlorination had been retained, reporting relating to any residual chlorine levels, pasteurisation, new supplies etc. were not identified. We understand that there was a local report of chlorination, but this was not evidenced as being provided to the WSG.

Reports could also usefully include fitting / removal of flow straighteners, point of use filters etc. to provide more holistic reporting of rectification work. ¹

¹ Note

An August 2018 internal Water Safety report identified issues including:

- *un-lagged pipes;*
- *excessive dead legs;*
- *inadequate return flows;*
- *TMV's passing; and*
- *flow restrictors installed in pipework; and*
- *non-flushing of infrequently used sinks.*

Management audit reports

The Water Safety Plan states that:

"A representative of the Estates team will carry out period audits of flushing across the Estate and provide reports to the WSG at each meeting".

It further states:

"The WSG shall be collectively responsible for auditing all processes being carried for the control of water safety in accordance with this WSP. Appointed departmental representatives on this WSG shall carry out a rolling programme of checks and audits of the processes and procedures being carried out within their department (either direct or indirect using UHB's externally appointed specialist independent advisor) to assess compliance, and report to the WSG at each quarterly meeting. Details of these checks and audits are specified in each departmental written procedure".

Such audits were not evidenced or reported.

An accompanied visit (to the sample areas) as part of this audit noted cupboard / ancillary rooms which were not in use, but which had not been notified to or identified by Estates. Some of these were flushed, but others were not (see **Finding 8**). Following this, some were subsequently disconnected during the audit.

Flushing audit reports should therefore be provided to the WSG in accordance with the Water Safety Plan and Water Safety Policy.