

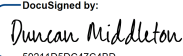


Drinking Water Service
Annual Report
2023-2024

Distribution list

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Department of Local Government, Water and Volunteers (formerly Department of Regional Development, Manufacturing and Water during the reporting period)	Water Supply Regulation

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1. Executive summary

The Queensland Bulk Water Supply Authority trading as Seqwater (SPID 507) is responsible for South East Queensland's bulk water supply system. This includes catchments, storages, water treatment plants and bulk transport infrastructure along with several small reticulation systems supplying recreation parks.

Seqwater's Drinking Water Service Annual Report (**report**) outlines the activities for the management of water quality risk and issues. The report covers the period from 1 July 2023 to 30 June 2024 (**reporting period**), during which Seqwater complied with the approval conditions of its Drinking Water Quality Management Plan (**DWQMP**).

Seqwater's operational and verification monitoring programs have occurred in accordance with the criteria documented in the approved DWQMP. Operational monitoring includes online monitoring with process instrumentation and operator testing designed to assess the performance of preventive measures and requirements for corrective actions. Verification monitoring involves a sampling and analytical testing program. Sampling and some on-site analyses are undertaken by Seqwater, with the majority of analytical testing undertaken by an external National Association of Testing Authorities (**NATA**) accredited laboratory. Verification monitoring during the reporting period included 34,552 tests of treated water at individual water treatment plants, and 62,404 drinking water tests throughout the SEQ Water Grid.

Seqwater also completed catchment and source water risk characterisation and monitoring activities, including catchment surveys and deployment of passive samplers to detect micropollutants. These activities help identify changes to the source water risk profile and support Seqwater operations by enabling informed decisions about daily operations, water security and supply planning.

Seqwater was compliant with the microbiological and health requirements in the *Public Health Regulation 2018* during the 2023-2024 reporting period for all of its water treatment operations and SEQ Water Grid zones. Water Treatment Plant (**WTP**) and Water Grid verification testing against the water quality criteria in the DWQMP resulted in one health-related *Australian Drinking Water Guidelines 2011* (**ADWG**) limit exceedance. An elevated level of total trihalomethanes (**THMs**) was detected at Capalaba WTP, following significant amounts of rain leading to increased natural organic matter concentrations in Leslie Harrison Dam. Further exceedances were prevented due to targeted WTP process adjustments as well as Water Grid optimisation.

Nine aesthetic exceedances were detected within the routine verification monitoring program during the reporting period. These predominantly related to elevated hardness at Beaudesert WTP. Eight exceedances were recorded in 2023 due to source water conditions and limitations in the treatment capability for reducing hardness at this site. Future connection of the Beaudesert supply zone to the SEQ Water Grid via the South West Pipeline (**SWP**) will reduce the risk of elevated hardness in this supply zone. The remaining aesthetic exceedance concerned elevated turbidity at Morayfield Pump Station on the Northern Pipeline Interconnector (**NPI**) in the SEQ Water Grid. This was caused by a sampling error associated with the design of the sample tap. Operational corrections were made at the sample tap and resulted in no further exceedances.

There were eight reportable events and non-compliances during the reporting period: one ADWG health-exceedance; three occasions where sampling and analysis were not completed in accordance with the verification monitoring program; and four events relating to operational situations which had the potential to impact on public health and/or continuity of supply. The events and non-compliances were reported to Water Supply Regulation (**WSR** or **Regulator**). Seqwater's management of these events was compliant with its DWQMP.

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Other drinking water quality management system improvement activities completed during the reporting period include the submission and approval of an amendment of the DWQMP by the Regulator; 10 risk assessment reviews; 24 Hazard Analysis Critical Control Point (**HACCP**) team meetings; 38 internal audits of WTPs and Water Grid sites; 24 water treatment performance assessments against the ADWG microbial Health-Based Target criteria; an external third-party AS NZS/ISO 22000:2018 Food Safety Management Systems (**ISO 22000**) certification surveillance audit; and a Regulated Fluoridation Systems audit conducted by Queensland Health. A regular audit of the DWQMP was not required to be undertaken during the reporting period.

These meetings, reviews and audits are part of a schedule that encompasses all of Seqwater’s WTPs and Water Grid sites. Findings were used to improve the drinking water quality management system. Long-term improvement initiatives identified through these assessments and reviews have been captured in a consolidated Drinking Water Quality Improvement Plan (**DWQIP**). A key improvement that was successfully delivered is the conversion of the Beaudesert Supply Zone from a free chlorinated to a chloraminated system in February 2024. This resulted in improved stability of the disinfection residual as well as a significant reduction in THM levels. This activity was a key enabler for the future connection of the Beaudesert Supply Zone to the SEQ Water Grid via the SWP.

2. Introduction

This is the 2023-2024 Drinking Water Service Annual Report for Seqwater, a registered service provider with identification (**SPID**) number SP507. Seqwater operates raw water storage, bulk treatment and transport assets from Noosa to the Gold Coast region and across to the base of the Great Dividing Range. Seqwater has responsibility for managing 32 operational WTPs, a desalination plant, 26 dams and 48 weirs. Not all of this infrastructure is related to the supply of drinking water, as some of the dams and weirs are used for irrigation schemes. Seqwater has eleven WTPs and a desalination plant connected to the SEQ Water Grid, 17 WTPs (including the offline Banksia Beach WTP) directly connected to SEQ Water Service Providers (**WSPs**) and five recreational WTPs (including the rechlorination-only Wivenhoe Dam WTP) operated solely for Seqwater’s recreational sites and supporting assets. Only those WTPs and SEQ Water Grid components operated for the supply of drinking water are included in the Seqwater DWQMP and this report.

Seqwater is operating under an approved DWQMP to ensure consistent supply of safe, high quality drinking water to protect public health. This is achieved through proactive identification and minimisation of public health-related risks associated with drinking water.

This Drinking Water Service Annual Report includes:

- the activities undertaken to operate our drinking water service during the financial year
- drinking water quality summary
- summary of our performance implementing our approved DWQMP.

This report is submitted to the WSR to fulfil our regulatory requirement under the *Water Supply (Safety and Reliability) Act 2008 (Qld) (Act)*. This report is made publicly available to our customers and the South East Queensland community through our website, or for inspection upon request at Seqwater’s Head Office during office hours on business days.

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2.1. Purpose

This Drinking Water Service Annual Report has been prepared in accordance with section 142 of the Act (refer to Table 1). The purpose of this Drinking Water Service Annual Report is to provide the Regulator with information on the overall performance of the DWQMP for the reporting period 1 July 2023 to 30 June 2024. This report also provides an accountability mechanism to our customers and communities.

Table 1 – Regulated conditions and implemented compliance

Drinking Water Service Annual Report Condition	Seqwater Compliance
<p>Section 142 Drinking water service annual reports This section applies for each financial year after a financial year in which a relevant service provider’s drinking water quality management plan has been approved. The provider must, unless the provider has a reasonable excuse—</p> <ul style="list-style-type: none"> • prepare a report (a drinking water service annual report) for the financial year complying with this section and, if section 142C(2) applies to the provider, that subsection; and • give the regulator a copy of the report within 120 business days after the financial year ends. 	<p>The current report is required to be submitted to the Regulator within 120 business days after the 2023-2024 financial year ends. This report has been prepared in accordance with the <i>Guideline for the preparation, review and audit of drinking water quality management plans</i> (Version 3, 1 October 2022), and to report on the approval conditions of the DWQMP. Section 142C(2) is not applicable.</p>
<p>Section 142(3) The report must state or include all of the following—</p>	<p>This report provides an update on the implementation of the DWQMP in accordance with the approval conditions and the above regulatory guidance.</p>
<p>a) the information required under the latest report requirement given to the provider;</p>	
<p>b) the actions the provider took to implement the plan;</p>	<p>Refer to Section 3 of this report.</p>
<p>c) the outcome of any review of the plan in the financial year and how the provider has addressed matters raised in the review;</p>	<p>Refer to Section 7 of this report. A regular review of the DWQMP was not required to be completed during the reporting period.</p>
<p>d) if a drinking water quality management plan audit report has been prepared for the financial year—a summary of its findings and any recommendations;</p>	<p>Refer to Section 6 of this report. A regular audit of the DWQMP was not required to be completed during the reporting period.</p>
<p>e) details of any information the provider gave the regulator under sections 102 and 102A in the financial year;</p>	<p>Refer to Section 5 of this report for details of incident/event reporting during the reporting period.</p>
<p>f) details of the provider’s compliance with water quality criteria for drinking water;</p>	<p>Refer to Sections 3 and 5 of this report. Enclosure 1a provides the 2023-2024 Water Quality Data Report. This report also includes aesthetic criteria.</p>

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Drinking Water Service Annual Report Condition	Seqwater Compliance
g) if the provider supplies drinking water to customers—details of any complaints to the provider about the provider’s drinking water service.	Not applicable. Seqwater is a bulk water provider. As per the <i>Guideline for the preparation, review and audit of drinking water quality management plans</i> (Version 3, 1 October 2022) bulk water providers who do not provide water directly to customers do not have to include this section in their Drinking Water Service Annual Report.
h) if the provider has reviewed a customer service standard during the financial year—the outcome of the review and how the provider has addressed matters raised in the review.	Not applicable. Under s 114(1) of the Act, Seqwater is not required to have a customer service standard because it has a service contract in place with each of its customers (WSPs, as above) in the form of a bulk water supply agreement made under s 360G of the <i>Water Act 2000</i> (Qld).

2.2. Plan overview

Seqwater must comply with the DWQMP approved by the Regulator and developed under the Act. The DWQMP forms part of the corporate drinking water quality management system Seqwater has implemented to include drinking water assets and activities captured by the Act. The Seqwater water quality management system has been developed to be consistent with the *Guideline for the preparation, review and audit of drinking water quality management plans* (2022) issued under the Act as well as the Framework for the Management of Drinking Water Quality within the ADWG. Accordingly, Seqwater adopts the multi-barrier approach for drinking water quality management.

Seqwater currently has responsibilities across all these barriers, which include:

- Catchments
- Storages and dams
- Water treatment
- Disinfection
- Supply systems (SEQ Water Grid)
- Distribution systems in recreation areas.

The DWQMP encompasses the drinking water quality management activities of Seqwater for all drinking water treatment plants and the bulk water supply systems managed by Seqwater. Accordingly, the plan applies to barriers from selective abstraction of the raw water to the management of bulk water supply assets and small distribution networks in Seqwater’s recreation areas.

The final barriers in the reticulated distribution system are predominantly managed by downstream WSPs who provide distribution and connections with consumers in all systems except for Seqwater’s recreation areas.

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3. Implementation of the DWQMP

A revised and updated version of Seqwater's DWQMP was submitted to the Regulator during the reporting period on 11 August 2023 following a review of the DWQMP in the 2022-2023 financial year. An amended version of the DWQMP was submitted to the Regulator on 19 February 2024 following the issue of an Information Requirement Notice by the Regulator. Seqwater received approval from the Regulator under Information Notice for the Decision dated 30 May 2024 (**Information Notice**) for the amended DWQMP. From 1 July 2023 to 30 May 2024 during the reporting period, Seqwater was required to comply with the previous version [11] of Seqwater's DWQMP. Seqwater received approval from the Regulator for the previous DWQMP under an Information Notice for the Decision dated 15 March 2021. Seqwater's compliance with the conditions in the Information Notice for its approved DWQMP is detailed in Section 3.1 of this report.

Amendments to the DWQMP were made in accordance with section 99A of the Act. The DWQMP amendments included various changes and additions to the DWQMP, associated site-based HACCP plans, and procedures identified in the DWQMP review. The risk assessment reviews completed during the reporting period are detailed in Section 3.2 of this report. The outcomes of these review activities were shared with relevant Seqwater staff via the 24 HACCP team meetings that were held during the reporting period. Changes to the DWQMP and site-based HACCP plans are detailed in Enclosure 4.

Seqwater maintains an operational monitoring program which supports the multiple-barrier approach to effectively manage drinking water quality as described in Section 3.3. This includes monitoring of key operational parameters by online instrumentation that feed into Supervisory Control and Data Acquisition (**SCADA**) systems as well as the operational monitoring performed by water treatment plant operators and internal process laboratories. Operator and process laboratory monitoring is used to verify the operation of the plant and the accuracy of online instrumentation. There have been no significant revisions to the operational monitoring program during the reporting period.

Seqwater's verification monitoring program covers a wide range of parameters determined using a risk-based approach. These are detailed in the DWQMP. The results of Seqwater's verification monitoring during the reporting period are described in Section 3.4 of this report. A detailed data report in the format prescribed by the Regulator is provided in Enclosure 1a. Analysis of verification samples was undertaken primarily by an external NATA-accredited laboratory. Seqwater undertakes sampling and specific analysis to support operations, and to inform verification monitoring, underpinned by a laboratory quality management system based on ISO 17025. This analysis includes on-site field tests and parameters analysed at Seqwater Process Laboratories, such as Taste and Odour compounds. In addition, the Seqwater verification monitoring program includes aspects at the cutting edge of modern monitoring. This analysis is undertaken by specialist laboratories that have implemented rigorous quality systems, based on ISO 17025. All verification monitoring results are recorded in Seqwater's Laboratory Information Management System (**LIMS**). Seqwater reviews the verification monitoring program on a half-yearly basis.

Seqwater continues to improve its drinking water quality management system. Actions in the risk management improvement program, known as the Drinking Water Quality Improvement Plan (**DWQIP**), were implemented during the reporting period as described in Section 4 of this report. The DWQIP changes made during the reporting period are provided in Enclosure 3 to this report.

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3.1. Approval conditions

As outlined above, the Regulator provided formal conditional approval of Seqwater’s amended DWQMP on 30 May 2024 under an Information Notice given pursuant to section 99(1)(b) of the Act. Seqwater received approval from the Regulator for the previous version of the DWQMP under an Information Notice for the Decision dated 15 March 2021. Summaries of the approval conditions and Seqwater’s compliance with these conditions are detailed in Table 2 and Table 3.

Table 2 – Conditional approval and compliance – 1 July 2023 to 30 May 2024

#	Condition	Compliance
1	<p>Water quality criteria for drinking water including:</p> <ul style="list-style-type: none"> i. The standards for drinking water quality prescribed in a regulation under the Public Health Act 2005 (Qld) (Public Health Act). ii. The criteria in any guideline, if any, made by the Regulator about the quality of drinking water. iii. The criteria for drinking water made in a condition applicable to the DWQMP. <p>For the purpose of (iii), the following applies:</p> <p>All parameters that have health guideline values in the ADWG are deemed to be water quality criteria that apply to this DWQMP. Parameters with only aesthetic guideline values are not considered to be water quality criteria and are not required to be reported.</p> <p>Seqwater is required to implement the verification monitoring program as detailed in the approved DWQMP and report any non-compliance with the water quality criteria for the parameters monitored.</p> <p>Additionally, Seqwater must report any non-compliance with a health guideline value through monitoring or other activity that is not part of this program.</p>	<p>Compliant.</p> <p>There was one non-compliance with a health guideline value in the ADWG as identified through the verification monitoring program (further detailed in Section 3.4.4).</p> <p>Reporting requirements were compliant.</p> <p>Seqwater has actively reported three situations involving failure to undertake water quality testing according to its verification monitoring program (further detailed in Section 5). One of these was discovered after the reporting period and will be detailed in the 2024-2025 Drinking Water Service Annual Report.</p> <p>In accordance with the DWQMP for situations when WTPs were offline and no water was available for sampling, a total of eleven samples, scheduled in between 1 July 2023 and 30 May 2024, were not taken (further detailed in Section 3.4.3).</p> <p>Seqwater is not aware of any other non-compliance with the health guideline values in the ADWG that could have been identified through other monitoring, including research activities.</p>

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#	Condition	Compliance
2	<p>Additional reporting requirements include:</p> <ul style="list-style-type: none"> An event including anything that has happened to Seqwater’s service which has escalated beyond its ability to control, and Seqwater believes, or is concerned, that public health may be impacted as a result. Where a parameter has no water quality criteria which Seqwater believes cannot be managed under its DWQMP and Seqwater believes, or is concerned, that public health may be impacted. <p>These reporting requirements must be made immediately to the Regulator and in the prescribed form within 24 hours.</p>	<p>Compliant.</p> <p>Seqwater has actively reported four events relating to operational situations which had the potential to impact on public health and/or continuity of supply (further detailed in Section 5).</p> <p>Reporting requirements were compliant.</p>
3	<p>If Seqwater becomes involved in any water quality research activities and becomes aware of a detection that must be reported as:</p> <ul style="list-style-type: none"> Non-compliance with water quality criteria An event A parameter with no water quality criteria <p>These reporting requirements must be made immediately to the Regulator and in the prescribed form within 24 hours, unless Seqwater has obtained formal acknowledgement of the research activity by the Regulator.</p>	<p>Seqwater is not aware of any non-compliance with the health guideline values in the ADWG, events that could impact on public health, or detections of parameters without water quality criteria that is identifiable from water quality research activities.</p>
4	<p>The State accepts no liability for any financial outlay incurred by Seqwater in complying with the drinking water quality management plan and the conditions in this approval.</p>	<p>No applicable claims/actions</p>

Table 3 – Conditional approval and compliance – 31 May 2024 to 30 June 2024

#	Condition	Compliance
7.2	<p>If, due to Seqwater’s verification or other monitoring activity, which includes a research program or another entity’s monitoring activity, Seqwater become aware of an incident¹ in its drinking water service, Seqwater must, unless it has a reasonable excuse, immediately notify the regulator of the circumstances and follow up that initial notification by giving the regulator written notice in the approved form, as soon as practicable.</p>	<p>Compliant.</p> <p>In accordance with the DWQMP for situations when WTPs were offline and no water was available for sampling, a total of four samples, scheduled in between 31 May 2024 and 30 June 2024, were not taken (further detailed in Section 3.4.3).</p> <p>Seqwater is not aware of any non-compliance with a health guideline value in the ADWG, events that could impact on public health, or detections of parameters without water quality criteria, that could have been identified through other monitoring activities.</p>

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#	Condition	Compliance
7.3	When Seqwater becomes aware of an event ² in its drinking water service, Seqwater must, unless it has a reasonable excuse, immediately (without reasonable delay) notify the regulator of the circumstances and follow up that initial notification by giving written notice in the approved form, as soon as practicable (within 24 hours).	There were no reportable events that occurred from 31 May 2024 to 30 June 2024. See Table 2 for events reported under the conditions of Version 11 of the DWQMP up to and including 30 May 2024.
7.4	Seqwater must give the regulator an investigation report, using the approved notice form, as soon as practicable (i.e., within 5 business days after completing the investigation). This notice must identify the cause of the incident ¹ or event ² and include the outcomes of the investigation, the actions taken to remedy the incident or event and any actions proposed to prevent or minimise the likelihood of a recurrence of the incident or event.	Reporting requirements were compliant.
7.5	Seqwater may seek the regulator’s formal acknowledgement for research activities, by submitting the Research Project Notification form to the regulator. Where Seqwater are operating under a research activity that has been formally acknowledged by the regulator, detections of parameters arising from this research activity must be reported as detailed in the regulator’s formal acknowledgement.	Compliant.
7.6	The next regular review of the approved DWQMP, to ensure the DWQMP remains accurate and relevant to the drinking water service provided, must be conducted by 1 July 2025 and at the intervals specified in section 8 of this notice to align with the Seqwater HACCP Audits & Risk Assessments Schedule for each financial year. This review must be conducted in accordance with the regulatory guidelines made by the regulator for conducting a regular review of a DWQMP.	Not applicable for this reporting period.
7.7	The next audit of the approved DWQMP must be conducted by 1 March 2025 and at the intervals specified in section 8 of this notice . This audit must be conducted in accordance with section 108 of the Act and the regulatory guidelines made by the regulator for undertaking an audit of a DWQMP and preparing audit reports.	Not applicable for this reporting period.
7.8	The State of Queensland accepts no liability for any financial outlay Seqwater incurs by implementing and complying with the approved DWQMP and the conditions of the plan.	No applicable claims / actions.

¹ ‘an incident’ is the detection of Escherichia coli (*E. coli*), an ADWG parameter or radioactivity that does not comply with the water quality criteria or a pathogen, i.e. a disease-causing microorganism (e.g. bacteria, viruses and protozoa).

² ‘an event’ is anything that has happened or is likely to imminently happen in Seqwater’s drinking water service, which cannot be managed under the approved DWQMP and/or which may adversely impact public health. An event includes, but not limited to:

- the detection of a parameter that has an aesthetic guideline value, but used as an indicator or a surrogate of other hazards (for example, turbidity), or
- the detection of a parameter that has no guideline value in ADWG, which may adversely impact public health (for example, chlorate),

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- failure to undertake the water quality testing described in the DWQMP or missing data, for example, laboratory errors, where rescheduling cannot demonstrate the required frequency,
- an operational situation, which requires a response to ensure safety and continuity of supply and which is not managed by an operational procedure and/or detailed in the DWQMP.

3.2. Risk assessment

Assessment of Seqwater’s water treatment operations and the SEQ Water Grid, along with 10 risk assessment reviews, were completed during the reporting period. There are 34 water supply schemes listed in Section 5.1 of the Information Notice for the approved DWQMP, including 32 water treatment plants, the Gold Coast Desalination Plant and the SEQ Water Grid (Supply System).

The findings from the recent risk assessment reviews are consistent with those reported in the 2022-2023 Drinking Water Service Annual Report. The main risks identified did not significantly change, and in most cases, pathogens are the predominant limiting hazard. From these recent reviews, significant risks and improvements to reduce those risks to acceptable levels were identified. Multiple sites have identified opportunities for:

- increased source water and raw water quality information collation to aid in decision-making to optimise source selection of raw water to the WTP
- process assessment and optimisation of coagulant dosing and mixing to optimise flocculation and settling performance
- improved system monitoring and control around filter performance and supernatant management to optimise filter performance and reduce filter breakthrough probability
- improved asset integrity protective measures against animal and stormwater ingress
- improved disinfection, secondary disinfection and network monitoring of disinfectant residuals.

In some cases, the residual (mitigated) risks have been further reduced by capital upgrades to assets as part of the regular asset management process. Improvements identified through incident management processes include protection from lightning strikes and power interruptions on control systems. Improvements identified through the risk assessment review process include SCADA upgrades, process instrumentation, and interlocks between these instruments and plant operation. These improvements have reduced the risk of non-compliant water leaving WTPs.

The remaining operational WTPs yet to have SCADA upgrades have been included in the forward program schedule. Seqwater is continuing to monitor progress in these areas through its capital works and renewals programs and the implementation of its Monitoring and Control Systems Asset Class Plan.

Seqwater reviews and improves the established Pre-requisite Programs (**PRPs**) and operational Pre-requisite Programs (**oPRPs**) every three years, or more frequently if required. This approach is consistent with the requirements of ISO 22000 to which Seqwater has maintained its certification (See Section 6.2 for more details). The latest improvements to these Programs were made outside the reporting period.

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3.3. Operational monitoring

3.3.1. Water treatment plant operational monitoring

Operational monitoring of water treatment includes real-time monitoring through process instrumentation, operator grab sample tests and observations, and analytical laboratory testing by Seqwater’s process laboratories. Operational monitoring programs for each WTP are designed to assess the performance of preventive measures identified for particular hazardous events and to prompt requirements for corrective actions.

Following the recommendations in the ADWG with regards to the reliance on operational monitoring, the site-specific HACCP plans generally specify online monitoring as the Critical Limit monitoring. All potential exceedances are first verified to rule out instrumentation measurement errors, and upon verification are reported to the Drinking Water Quality team within a specified timeframe.

The main preventive measures are well-established across all WTPs, with Critical Control Points (**CCP**) monitored by online instrumentation, which is clearly identified in the process flow diagrams in each site-based HACCP Plan. Where possible, multiple levels of alarms for each online instrument through the SCADA system provide early warning of process control issues and early intervention by Operations staff. Additionally, some alarm set points are interlocked to shut down the WTP before Critical Limits are exceeded.

The HACCP Plan Wall Chart procedures document the Action Limits, Critical Limits and key corrective actions, including clear instructions for Operations staff and their supervisors on when the process is to be rated down or shut down, as well as reporting requirements. Across Seqwater’s treatment operations, the operational monitoring system has worked successfully throughout the year with many improvements implemented.

Internal auditing (Section 6) reviews the effectiveness of operational monitoring, online water quality instruments, alarm set points and the compliance with the CCP procedures. The main preventive measures typical of most WTPs are listed in Table 4 with an update of the status of the preventive measure and operational monitoring.

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Table 4 – Preventive barriers in water treatment

Preventive Measure	Related Hazardous Events	Operational Monitoring	Status
Coagulation	<ul style="list-style-type: none"> Raw water exceeds treatment capability Coagulant dosing failures Low alkalinity Poor pH control Poor or excessive mixing Incorrect dose rates Inadequate coagulation aids 	<ul style="list-style-type: none"> Dose water pH Chemical dosing alarms Observation checks of flocculation and sedimentation 	<p>Instrumentation for dosed water pH, including alarms, is established at all sites using aluminium sulfate (alum) as the coagulant and where pH regulation of the dosed water is in place.</p> <p>Additionally, the instrumentation and SCADA upgrade provides settled water turbidity analysers and alarms across all of Seqwater’s sites that have a clarification or Dissolved Air Flotation process. Operator grab sample monitoring has been compliant with the WTP’s HACCP plan which documents operational monitoring.</p>
Filtration	<ul style="list-style-type: none"> Raw water exceeds treatment capability Coagulation failure Solids carryover Poor backwashing Filtration break-through 	<ul style="list-style-type: none"> Online turbidity for each cell/filter outlet SCADA tools such as head loss, runtime / production For membrane filtration sites - Pressure Decay Test. 	<p>Instrumentation is in place for monitoring individual filters for filtered water turbidity at all relevant sites. All sites have alarms that automatically dial-out to the on-call operator’s mobile phone.</p> <p>Most sites have interlocks in place to stop operation or activate filter backwash. There is a program of control system upgrades to implement this functionality across all sites where it is achievable.</p> <p>Online instrumentation and operator grab sample monitoring has been compliant with the WTP’s HACCP plan which documents operational monitoring.</p>

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Preventive Measure	Related Hazardous Events	Operational Monitoring	Status
Disinfection (by Ultraviolet irradiation (UV))	<p>High flows – low contact time</p> <p>Low flows – not enough turbulence to distribute the dose</p> <p>Low UVT – unable to adequately penetrate microorganisms</p>	<p>Online UV intensity and flows</p> <p>UV Dose</p> <p>Ultraviolet Transmittance (UVT)</p>	<p>UV disinfection is typically implemented at sites that require pathogen treatment beyond what is achievable by ‘conventional treatment’. These sites include Kilcoy, Capalaba, Beaudesert, and Boonah-Kalbar WTPs. It is also implemented at smaller sites, such as Dayboro, Kenilworth and Linville WTPs where it forms an efficient primary pathogen treatment process. UV disinfection has worked effectively at these sites without significant issues/excursions.</p>
Disinfection (by chlorination)	<p>Chlorine dosing failures</p> <p>Incorrect dose rates</p> <p>Poor pH control</p> <p>High flows – low contact time</p> <p>Low reservoir levels</p> <p>Contamination to reservoir</p> <p>Filter break-through causing shielding</p>	<p>Online free chlorine after dosing and after contact time</p> <p>Online pH and turbidity after contact time</p> <p>Reservoir levels and flows</p> <p>Chemical dosing alarms</p>	<p>All sites have online instrumentation monitoring free chlorine, pH and flow in the dosed filtered water and treated water. Alarms dial-out to the on-call operator’s mobile phone. At most sites, interlocks are also implemented that stop the WTP process. There is a program of control system upgrades to implement this functionality across all sites where it is achievable.</p> <p>Online instrumentation and operator grab sample monitoring has been compliant with the WTP’s HACCP plan which documents operational monitoring.</p>

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Preventive Measure	Related Hazardous Events	Operational Monitoring	Status
Fluoridation	Overdosing fluoridation chemical	<p>Online fluoride monitoring pre and post on-site reservoir</p> <p>Operator fluoride monitoring – concentration by lab testing</p> <p>Operator monitoring – daily calculated fluoride dose using product weights and flow meter data.</p> <p>Chemical dosing alarms</p>	<p>The fluoride dosing monitoring arrangements are fully established and documented. Operator testing and checks of the online monitoring system are performed at least daily.</p> <p>Queensland Health periodically audits fluoridation of the water supply at all Seqwater sites with fluoridation systems.</p>
Reticulation (recreation sites)	<p>Ingress or infiltration</p> <p>Corrosion and deterioration of assets</p>	<p>Observation</p> <p>Chlorine residual monitoring</p> <p>Demand monitoring (plant operation hours and reservoir levels)</p> <p>Vermin proofing inspections on reservoirs.</p>	<p>Reticulation systems are monitored by operational staff to ensure there is no ingress from vermin or through loss of positive pressure. System leaks are identified by these inspections and the draw on the plant’s capacity. Scheduled maintenance inspections and condition assessments are also conducted.</p> <p>Chlorine testing on recreation park taps is undertaken and supported by verification monitoring at the same sample sites.</p>

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3.3.2. SEQ Water Grid operational monitoring

In the DWQMP, operational monitoring includes the planned sequence of measurements and observations to assess and confirm the performance of preventive measures identified for particular hazardous events. Measurements of operational parameters indicate the effectiveness of processes. As part of the ADWG Framework, ISO 22000 and HACCP standards, these operational measures have been identified and summarised within the Supply System HACCP plan as CCPs and oPRPs.

The preventive measures are well established within Seqwater, with CCPs monitored by online instrumentation throughout the SEQ Water Grid. Network control room staff can react to the exceedances when notified through the SCADA system. Alarming is programmed into the SCADA system at three different incident levels, each defining the severity of the exceedance. Each incident level has a documented contingency and escalation procedure for staff to follow.

Internal auditing and compliance spot checks monitor the oPRPs. The principal preventive measures are listed in Table 5. The most common limiting hazard identified is pathogens. Unacceptable risks requiring further treatment are listed in the improvement plan (Section 4) of this report.

Table 5 – Preventive measures in the SEQ Water Grid

Preventive Measure	Related Hazardous Events	Operational Monitoring	Status
Water quality considerations as part of the Monthly Operating Supply Schedule (MOSS) & routine meetings with WSPs (Regional Operational Managers Meeting). Includes drought operating modes.	Non-compliant water supplied to the SEQ Water Grid by Bulk Water Suppliers Deterioration of water quality in service reservoirs due to variable water ages	This is issued monthly to the Drinking Water Quality team for review and to provide feedback on any foreseen issues arising from different source waters.	This formalised process continues as the MOSS at Seqwater. Water quality issues are raised if there are concerns of any localised issues and the MOSS amended accordingly (e.g. in case Mt Crosby WTPs experience elevated levels of geosmin and 2-methylisoborneol (MIB) in raw water).
Maintain disinfection residual	Non-drinking water or organic matter entering service reservoir or pipeline	Chlorine, pH and temperature parameters are measured online at all Key Interface Points which is representative to each water zone.	Established SCADA systems and Critical Limit alarm levels notify the network control room of low chlorine residual. Escalation procedures

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Preventive Measure	Related Hazardous Events	Operational Monitoring	Status
	Contamination to reservoirs by access by third party Contamination to reservoir by vermin entry	These signals are transferred and alarmed at the network control room. Control room escalation and corrective action procedures are audited routinely. Training is delivered for new control room staff.	covering different severities of alarms are well established and are followed by control room staff. Corrective actions are documented in a procedure and are followed by control room staff and SEQ Water Grid operations management. A documented procedure on maintaining chlorine residual is used by operational staff.
Service Reservoir Inspection Program	Ingress of non-drinking water to reservoirs Vermin entry to reservoir Corrosion and deterioration of assets	Service reservoir inspections are carried out monthly using a checklist and photo evidence process. These records are audited routinely to identify any deficiencies. These inspections are supplemented by annual external inspections using Unmanned Aerial Vehicles (UAV), and three-yearly internal inspections using submersible Remote Operated Vehicles (ROV) combined with specialist software to inspect and track deterioration.	This process and water quality focused culture is well established within the business. Any issues identified are raised and corrected through the Seqwater maintenance system and for larger improvements via the renewals process within the capital improvement program.

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Preventive Measure	Related Hazardous Events	Operational Monitoring	Status
Mains Hygiene Procedure	Stagnation of reservoirs and pipelines Commissioning new assets and pipelines Maintenance and operational changes to the SEQ Water Grid	This procedure provides the formal process to prevent contamination of pipelines and reservoirs during maintenance activities. It also covers disinfection of assets before returning to service. On-site compliance checks are routinely carried out to identify any deficiencies.	This process and water quality focused culture is now well established within Seqwater. Training is delivered during the induction of new field staff.
Locked and alarmed hatches on reservoirs	Contamination to reservoirs by access of third party	All reservoirs' hatches are locked, and alarm systems notify the network control room of any unauthorised access to reservoirs. Closed Circuit TV cameras are also in place at some reservoir sites. Security guards routinely patrol the reservoir sites.	The alarming of reservoirs is tested routinely with network control room staff well versed in the procedures to follow if a security breach occurs. Access to these reservoirs is managed by Seqwater's works access and permit to work procedures.
Maintaining Positive Pressure	Ingress of non-potable water or organic matter to pipelines	Pressure and flow are monitored online at locations throughout the SEQ Water Grid. These locations are alarmed and notify the network control room of any low-pressure situations.	The network control room staff are well versed in the procedures to follow if low pressure occurs within the SEQ Water Grid. Planned and unplanned pipeline isolations are managed by the Disinfection of Water Mains Procedure.

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Preventive Measure	Related Hazardous Events	Operational Monitoring	Status
<p>Optimisation of re-chlorination through automated control systems</p> <p>Maintain or treat to lower Dissolved Organic Carbon (DOC)/Bromide Levels</p>	<p>Formation of disinfection by-products</p>	<p>Most chemical dosing facilities are comprehensively equipped with system redundancies including dual online instruments, Uninterruptable Power Supply, multiple chemical dosing pumps, back-up telemetries with multi-barrier alarming to the network control room.</p>	<p>Control systems are well established and have a proven historical track record in providing accurate and timely information. The network control room has comprehensive documentation to assist in the control of these systems and are well versed in the procedures to operate these stations efficiently and effectively.</p>
<p>Pigging or super-chlorination of pipelines</p>	<p>High flow or changes in flow rate or direction in pipelines</p>	<p>Turbidity and conductivity parameters are measured online at all Key Interface Points.</p>	<p>Routine cleaning programs for reservoirs are in place. However, there is no routine scheduled pigging program for the existing pipelines. Biofilm testing has proven biofilms are in low volume and pathogens have not been detected in the samples measured. High flows and direction changes are managed through the control systems and operating manuals.</p>

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3.4. Verification monitoring

The results of Seqwater's verification monitoring during the 2023-2024 reporting period are summarised below. The detailed data report at Enclosure 1a is in the format prescribed by the Regulator. This program includes:

- scheme component (e.g. reticulation, source water)
- parameter
- unit of measure
- total number of samples collected (number of analyses)
- number of samples that did not meet the water quality criteria
- minimum concentration or count
- maximum concentration or count
- average (arithmetic mean) concentration or count.

The analysis results from SEQ Water Grid sampling points that were offline at the time of sampling were excluded from the data report as these may not be representative of the quality of the water provided to the WSPs. For completeness, these omitted analysis results are presented separately in Enclosure 1b.

Non-routine verification monitoring results for PFAS compounds can be found in Enclosure 1c.

For all parameters tested more than once a year, the frequency of sampling has been distributed evenly throughout the year (weekly, monthly, quarterly or six-monthly).

3.4.1. Analysis of Micropollutants using Passive Samplers

The sampling and analysis of micropollutants using a passive sampler methodology began in July 2014 for catchment sites where the sampling devices could be deployed. The micropollutants analysed included pesticides, pharmaceuticals and personal care products. This analysis is undertaken by a specialist laboratory under a rigorous internal quality system.

The passive sampler reports for sampling conducted during the 2023-2024 reporting period are provided at Enclosure 2a and 2b. There were no exceedances of the ADWG values observed during the reporting period for these chemicals using passive sampling methodologies. Some parameters have been detected at trace levels, but this has generally been two orders of magnitude below the guideline values.

3.4.2. Compliance with DWQMP and Key Performance Indicators

Drinking water quality compliance is measured using the methods recommended by the ADWG and the *Public Health Regulation 2018 (PHR)*. For corporate Key Performance Indicator (**KPI**) reporting, the water quality results from routine monitoring in each supply zone are assessed over a 12-month period against the water quality criteria, with the final report being issued in June each year. A supply zone is defined as a WTP and if relevant, the connected downstream components of the SEQ Water Grid. The methods are briefly described below:

3.4.2.1. Microbiological compliance

A supply zone is compliant if at least 98% of routinely monitored samples do not exceed the water quality criteria, namely *E. coli* (as per section 52 of the PHR).

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3.4.2.2. Health related compliance

For parameters sampled eight or more times during the year, the 95th percentile result of each health-related parameter is used for assessment against the water quality criteria, being the health guideline values in the ADWG as per section 52 of the PHR. For parameters sampled less than eight times per year, the maximum result is used for assessment against the water quality criteria. If the 95th percentile (or maximum, if sampled less than eight times) value is greater than the water quality criteria, then the whole zone is deemed non-compliant.

3.4.2.3. Aesthetic compliance

The average of each parameter is assessed against the water quality criteria (aesthetic guideline values from the ADWG) only if there are impacts to downstream users. If any value is greater than the water quality criteria, then the whole zone is deemed non-compliant.

Seqwater was measured to be compliant during the 2023-2024 reporting period for all its water treatment operations and SEQ Water Grid zones for microbiological, health and aesthetic compliance.

3.4.3. Water treatment plant verification monitoring

Verification monitoring occurred in accordance with Seqwater’s Water Quality Verification Monitoring Plan. This was primarily undertaken by the NATA-accredited (ISO 17025) contracted Laboratory Service Provider at Seqwater’s raw water, treated water and recreation sites distribution system sample points, covering more than 70 different parameters at various frequencies. On-site field testing and monitoring, for example on free and total chlorine and pH, supports operations. This testing also forms part of the verification monitoring program and is undertaken by Seqwater in accordance with its laboratory quality management system, based on ISO 17025. The verification program provides the necessary information to validate the preventive approach to water quality management is effective.

A summary of verification monitoring of WTP treated water for the reporting period is provided in Table 6. The statistics from the verification monitoring results for all parameters for raw water and treated water at each operational site is provided within Enclosure 1a. The recreational plants show a larger number of analyses performed as these sites include reticulation system monitoring in WTP test count.

Table 6 – WTP verification monitoring summary

Name of Scheme Component	Number of Analyses Performed	Number of Individual ADWG Health Exceedances	Number of Individual ADWG Aesthetic Exceedances
Amity Point WTP	801	0	0
Beaudesert WTP	1029	0	8
Banksia Beach WTP	0	0	0
Boonah-Kalbar WTP	934	0	0
Canungra WTP	954	0	0
Capalaba WTP	926	1	0
Dayboro WTP	812	0	0

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Name of Scheme Component	Number of Analyses Performed	Number of Individual ADWG Health Exceedances	Number of Individual ADWG Aesthetic Exceedances
Dunwich WTP	813	0	0
Esk WTP	864	0	0
Ewen Maddock WTP	904	0	0
Gold Coast Desalination Plant	1492	0	0
Hinze Dam WTP	1244	0	0
Image Flat WTP	1848	0	0
Jimna WTP	897	0	0
Kenilworth WTP	760	0	0
Kilcoy WTP	946	0	0
Kirkleagh WTP	1272	0	0
Kooralbyn WTP	950	0	0
Landers Shute WTP	907	0	0
Linville WTP	1366	0	0
Lowood WTP	980	0	0
Maroon Dam WTP	1242	0	0
Molendinar WTP	909	0	0
Moogerah Dam WTP	1241	0	0
Mt Crosby East Bank and West Bank WTPs	2109	0	0
Mudgeeraba WTP	910	0	0
Noosa WTP	1361	0	0
North Pine WTP	921	0	0
North Stradbroke Island WTP	854	0	0
Point Lookout WTP	801	0	0
Rathdowney WTP	942	0	0
Somerset Dam WTP	855	0	0
Wivenhoe Dam WTP	1708	0	0
Total	34552	1	8

During the reporting period, there were two occasions where sampling and analysis were not completed in accordance with the verification monitoring program (detailed in Section 5 of this report). Additionally, in

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accordance with the DWQMP for situations when WTPs are offline and no water is available for sampling, a total of fifteen (15) samples were not taken:

- Nine samples not taken at Noosa WTP when the plant was offline for the construction of a new treated water reservoir roof and treated water could not be sampled.
- Five samples not taken at North Pine WTP when the plant was offline for planned maintenance and treated water could not be sampled.
- One sample not taken at Jimna WTP when the plant was offline due to poor raw water quality and treated water could not be sampled.

3.4.4. Analysis of the water treatment plant verification monitoring data

Through an assessment of the water quality data from the verification program, it was found that all WTPs were compliant against the ADWG health guideline values for drinking water. One individual health exceedance was recorded during the reporting period, as well as 8 aesthetic exceedances (for one parameter at one site).

Overall, the count of ADWG health-related exceedances over the past few years has remained at a relatively constant low level with no exceedances occurring in the 2018-2019, 2020-2021 and 2022-2023 reporting periods, which is a considerable achievement given the number of diverse schemes and systems. The increase in the number of aesthetic exceedances since 2021-2022 has almost exclusively been due to increased treated water hardness levels at Linville WTP (2022) and Beaudesert WTP (2023). Otherwise, exceedances have generally been decreasing (Figure 1).

The one health guideline exceedance in routine verification monitoring was caused by an elevated THM level at Capalaba WTP (260 µg/L, 2 February 2024, ADWG health guideline value: 250 µg/L). This result was obtained following a significant wet weather event leading to increased natural organic matter concentrations in Leslie Harrison Dam, the source water for Capalaba WTP. Whilst difficult raw water conditions persisted, further exceedances were prevented through targeted WTP process optimisation and support from the SEQ Water Grid.

The eight aesthetic guideline exceedances in routine verification monitoring were attributed to elevated hardness results in the treated water from Beaudesert WTP (250-320 mg/L, 16 August 2023 – 8 November 2023). These are due to an increase in source water hardness levels in combination with the limited water softening ability of the WTP. Connecting the Beaudesert supply zone to the newly constructed SWP will reduce the instances of increased hardness and improve water security for Beaudesert.

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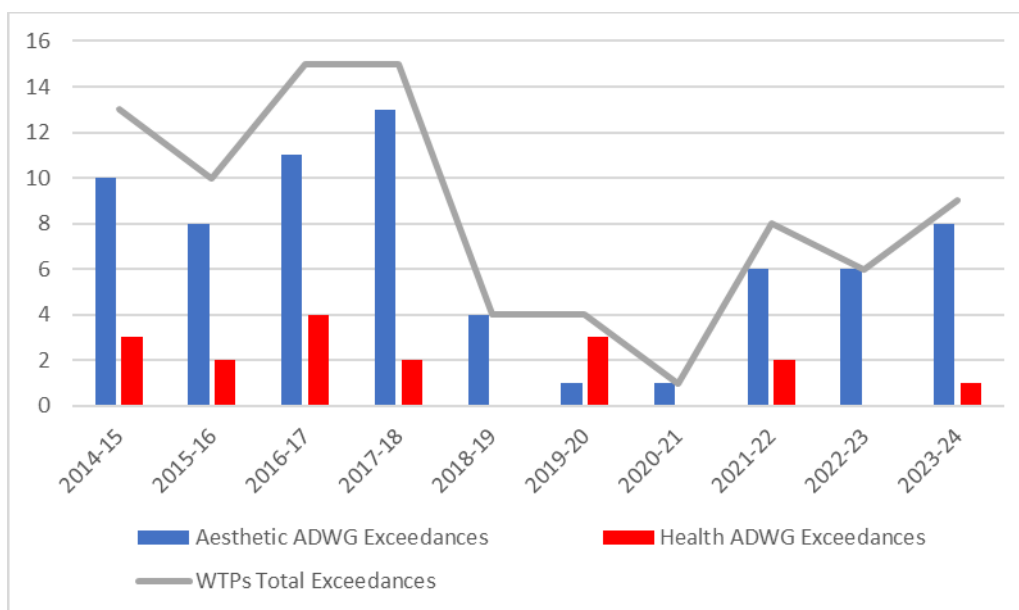


Figure 1 – WTP exceedances over different reporting periods

Seqwater continues to seek and implement improvements for its treatment processes and preventive measures. With regards to continually improving water quality (for example, in accordance with Element 12 of the Framework for Management of Drinking Water Quality), these exceedances are considered in risk assessments and subsequent risk assessment reviews. Where the mitigation of a risk has been determined to be inadequate, even for aesthetic parameters, an improvement action is recorded in the Drinking Water Quality Improvement Plan. A version of the DWQIP that focuses only on unacceptable health risks can be found in Enclosure 3. Subsequent processes ensure those improvement actions are addressed appropriately. This currently includes treatment plant upgrades, improved instrumentation, early intervention by Operations and Engineering staff through changes in process control and improvements in sampling practices and the third-party NATA-laboratory performance.

3.4.5. SEQ Water Grid verification monitoring

Verification monitoring occurred in accordance with the Supply System Water Quality Monitoring Plan. Sampling and on-site field tests were undertaken by Seqwater’s Scientific Services team and laboratory testing was undertaken by a contracted NATA-accredited laboratory service provider. This covered more than 30 different parameters with weekly and monthly sampling frequency scheduled in eight different zones. The verification program provides the necessary information to validate the preventative approach to water quality management is working effectively.

The SEQ Water Grid has been assessed as compliant for all eight zones for microbiological, health and aesthetic compliance during the reporting period. A summary of verification monitoring of SEQ Water Grid (bulk) water for the reporting period is provided in Table 7.

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Table 7 – SEQ Water Grid verification monitoring summary

Name of scheme component	Number of Analyses Performed	Number of Individual ADWG Health Exceedances	Number of Individual ADWG Aesthetic Exceedances
Brisbane	24696	0	0
Eastern Pipeline Interconnector (EPI)	713	0	0
Gold Coast and Network Integration Pipeline (NIP)	3436	0	0
Logan	5184	0	0
Northern Pipeline Interconnector (NPI)	10974	0	1
Redland	5652	0	0
Southern Regional Pipeline (SRP)	11749	0	0
Total	62404	0	1

3.4.6. Analysis of the SEQ Water Grid verification monitoring data

There were no ADWG health exceedances and one aesthetic guideline exceedance for the SEQ Water Grid during the reporting period, consistent with the low numbers of exceedances for each category since 2014-2015 reporting period (Figure 2). The overall trend supports the continued successful operation of the SEQ Water Grid to provide safe and high-quality drinking water.

The ADWG aesthetic exceedance was attributed to an elevated turbidity result (6.8 NTU, 1 November 2023) at Morayfield Pump Station on the NPI. This result was considered unrepresentative of the water quality in the NPI, as the elevated turbidity was caused by a build-up of solids in the sample tap pipework. Operational corrections at the sample tap were made and resulted in no further exceedances.

One free ammonia result from Aspley Water Quality Management Facility (WQMF) in the Brisbane network exceeded the ADWG aesthetic limit. However, this was considered a 'non-representative sample' as the WQMF was offline at the time of sampling. It is known that small amounts of ammonia can bleed into the main while the WQMF is offline and can lead to elevated free ammonia detections that are not representative of the water provided to customers.

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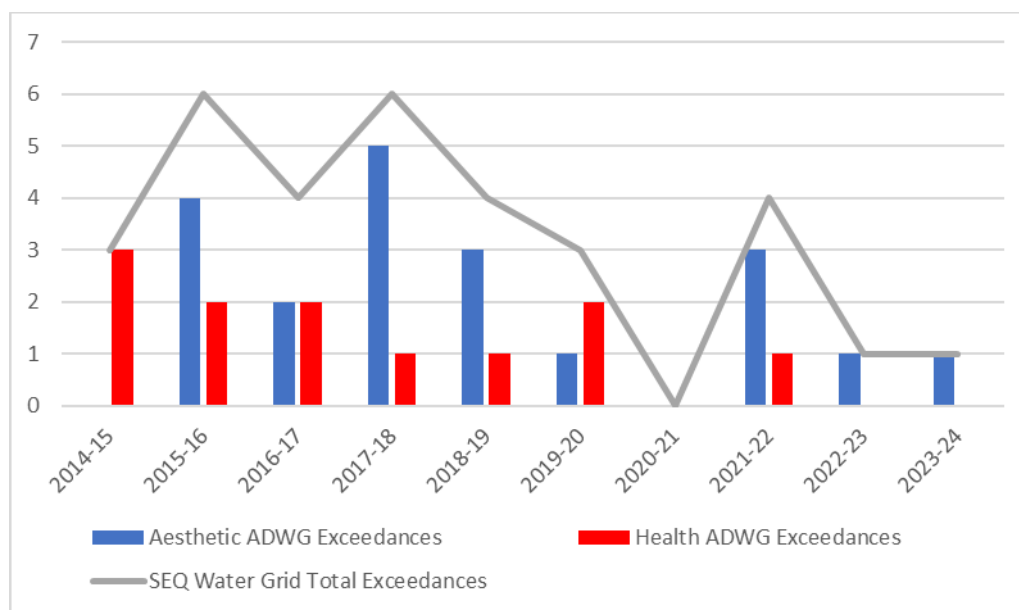


Figure 2 – SEQ Water Grid exceedances over different reporting periods

The low number of exceedances across the SEQ Water Grid since 2014-2015 is supported by good operating practice. Improved source water conditions also contributed to a strong performance in some of the previous reporting periods, although significant challenges for water treatment and distribution are occasionally experienced due to increased heavy rain events.

4. Improvement plan

Improvements continue in accordance with the DWQIP. The progress made during the reporting period to reduce health-related risks and improve the reliable provision of safe drinking water is tabled in Enclosure 3 of this report. Any improvements which are yet to be implemented are reassessed and prioritised through the internal audit and risk assessment review schedule. Asset-related improvements are assessed via the capital program prioritisation process. The changes to the DWQMP identified in risk assessment reviews, HACCP team meetings and the investigation of incidents, reflect the significant amount of progress Seqwater has made in improving its drinking water quality management system. The details of these changes are provided in the Register of Changes to DWQMP, HACCP Plans and Procedures at Enclosure 4. A summary of significant water quality improvements delivered in the reporting period and taken from the DWQIP or from other sources like the Renewals Program, is listed below.

Whole of Business:

- Ongoing progress on the Regional Secondary Disinfection Optimisation Project – targeted at improving disinfection residuals in Seqwater chloraminated water supply zones, as a key Water Quality Service Standards project
- Completion of all Source Water Assessments for microbial Health-Based Treatment Targets
- Continuation of consistent reservoir inspection program
- Implementation of robot cleaning inside treated water reservoirs

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- Development of a new online analyser maintenance management system (project in progress)
- Ongoing renewal program for Laboratory, Hydrometric and Catchment Water Quality equipment
- Ongoing water quality improvement planning sessions with each retailer customer to improve service delivery in line with the individual Future Desired Water Quality Service Standard Memorandums of Understanding.

Northern Region:

- Treated water and filtered water reservoir roof replacements at Noosa WTP
- Caustic dosing system upgrade at Noosa WTP
- Installation of individual Biological Activated Carbon (**BAC**) filtered water turbidity analysers at Noosa WTP
- Potassium permanganate dosing reinstated at Noosa WTP to assist with water treatment following the lowering of Lake Macdonald to manage dam safety risk and enable the dam safety upgrade project
- BAC filter enclosure at Ewen Maddock WTP
- Supernatant turbidity analyser installation at Ewen Maddock WTP
- Sedimentation basin 2 relining at Landers Shute WTP
- Commissioning of post lime dosing pumps at Image Flat WTP
- Filter media replacement at Landers Shute WTP (project in progress)
- Service water fluoride upgrade at Landers Shute WTP (project in progress)
- Commissioning of the Woombye Offtake on the NPI.

Central Region:

- Improvements to the Control System at Mt Crosby East Bank and West Bank WTPs and Holts Hill (project in progress)
- Progress with planning and preparation for major upgrades at Lowood WTP, which includes clarifier renewal, filter backwash automation and UV disinfection
- Installation of water tanker connection points at Lake Wivenhoe and Lumley Hill reservoirs
- Powdered Activated Carbon (**PAC**) improvement and optimisation project at Somerset Dam WTP
- Update to the mid-Brisbane River model to improve wet weather event response.

Southern Region:

- Tanker water import point installed at Amity Pointy WTP, Dunwich WTP, Point Lookout WTP
- Tanker water export point installed at North Stradbroke Island WTP
- Minor asset improvements at North Stradbroke Island WTP
- PAC system optimisation for increased reliability at Capalaba WTP
- Filter backwashing flow improvement for reduced ripening turbidity at Mudgeeraba WTP
- Filter media top-up at Mudgeeraba WTP
- Chlorine storage and dosing improvements at Canungra WTP
- Implementation of treated water chloramination at Beaudesert WTP
- Introduction of alternate coagulants during events at Maroon Dam and Moogerah Dam WTPs (project in progress)
- Programmable Logic Controller (**PLC**) control changes relating to filter operations at Boonah-Kalbar WTP (project in progress)
- Progression of the planning for installation of UV disinfection systems for Kooralbyn and Rathdowney WTPs.

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5. Drinking water quality incidents

Seqwater is required to report drinking water quality incidents and events to the Regulator as per section 7 of the Information Notice for the approved DWQMP dated 30 May 2024 and section 6 of the Information Notice for the previous version of the approved DWQMP dated 15 March 2021 (see Table 2 and Table 3 above). The following section summarises information given to the Regulator detailing:

- Non-compliances with the water quality criteria for drinking water, and the corrective and preventive actions undertaken in response
- Water quality ‘events’ during the reporting period, including corrective and preventive actions
- Comments on the effectiveness of any preventive/control measures.

A summary of incidents at Seqwater’s treatment operations and SEQ Water Grid reportable to the Regulator are shown in Table 8. During the reporting period, Seqwater had eight incidents and events that were considered ‘reportable’. One of these involved a failure to undertake sampling in accordance with the verification monitoring program, which was discovered and reported to the Regulator after the reporting period and will be detailed in the 2024-2025 Drinking Water Service Annual Report.

Reporting to Water Supply Regulation was completed within the required timeframes.

Table 8 – Summary of incidents and events at Seqwater’s treatment operations and SEQ Water Grid

Incident Number	Name of scheme component	Date Reported	Description of the Event/Incident	Improvements
DWI-507-24-10757	Scenic Rim and Gold Coast WTPs	26 December 2023	Extreme weather causing widespread disruptions to water supply. Severe weather systems across the Scenic Rim and Gold Coast regions late on 25 December 2023 caused widespread power outages and localised flooding that impacted Beaudesert, Kooralbyn, Rathdowney, Boonah-Kalbar, Moogerah Dam, Canungra and Mudgeeraba WTPs.	All systems worked as designed.

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Incident Number	Name of scheme component	Date Reported	Description of the Event/Incident	Improvements
			All affected WTPs had power restored by 29 December 2023 and, as raw water conditions allowed, returned to service. All operational and verification monitoring performed over this time demonstrated all WTPs had shut down as per operating manuals, and supply of safe drinking water had been maintained.	
DWI-507-23-10746	Hinze Dam WTP	31 December 2023	<p>Failure to undertake sampling in accordance with the verification monitoring program.</p> <p>Hinze Dam WTP lost power due to storm activity on 25 December 2023 and remained without power until 4 January 2024. As the level in the Treated Water Reservoir had dropped below the minimum level required for taking samples from the sample point, it was not possible to comply with the regulatory requirement of weekly (<i>E. coli</i>) sampling. The Seqwater Administration Office and the Hinze Dam Visitor Centre and café remained closed to the public until the network was sufficiently flushed and sampling results confirmed the correct pH, free chlorine concentration and absence of <i>E. coli</i>.</p>	Power outages due to weather events as severe as the one on 25 December 2023 cannot be prevented. However, when they occur, Seqwater will consider shutting all valves/taps in the area to maintain positive pressure in the network and to conserve enough water in the Treated Water Reservoir to enable sampling.
DWI-507-24-10821	Beaudesert WTP	31 January 2024	<p>Use of an alternative source of water.</p> <p>Due to increased rainfall in the Logan River catchment, high amounts of sediment in the raw water at Beaudesert WTP caused reduced operating capacity and difficulties meeting demand. Low treated water storage levels at the WTP and the Beaudesert network triggered the need to supplement the raw water by feeding water from the recently installed SWP into Beaudesert WTP prior to its filtration step. Operational limits have not been exceeded and supply of safe drinking water has always been maintained.</p>	The commissioning and implementation of the SWP into the Beaudesert supply zone will result in the region being more resilient to water shortages.

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Incident Number	Name of scheme component	Date Reported	Description of the Event/Incident	Improvements
DWI-507-24-10822	Mt Crosby WTPs	31 January 2024	<p>Dirty water severely impacting water treatment.</p> <p>Mt Crosby East Bank and West Bank WTPs were shut down and taken offline on 31 January 2024 due to highly elevated raw water turbidity levels (>300 NTU) following a heavy rainfall event in the Mid-Brisbane River and Lockyer Valley catchments. The poor raw water quality severely impacted water treatment, resulting in difficulties operating within the filtration Critical Control Point (CCP) Critical Limits. Water Grid arrangements were made to supply Seqwater’s Central Region with water from the Northern and Southern Regions while WTP optimisations were undertaken to restart the Mt Crosby WTPs on reduced flows. The filtration CCP Critical Limits for filtered water turbidity were increased temporarily under Seqwater's emergency Management of Change process to provide a feasible operating envelope for filter operation.</p> <p>Gradually improving raw water quality in combination with improvements to filter aid use and the filter backwashing sequence resulted in improved filter performance. This allowed for all WTP processes to be brought back into service and for the normal filtration CCP Critical Limits to be reinstated.</p> <p>Supply of safe drinking water was maintained throughout this event.</p>	<p>Investigation of this event resulted in an array of corrective and preventive actions, most notably for water quality:</p> <ul style="list-style-type: none"> • Creating a procedure for managing dirty water events in the Mid-Brisbane River. • Investigating alternative coagulants • Further investigation to determine the physical and chemical structure of the organic matter • Investigation into the long-term WTP infrastructure needs • Review of emergency management plans
DWI-507-24-10826	Capalaba WTP	5 February 2024	<p>Exceedance of the ADWG health-limit for total trihalomethanes.</p> <p>Significant amounts of rain led to increased levels of natural organic matter in the Capalaba WTP source water (i.e. Leslie Harrison Dam). Free chlorination of water containing elevated levels of organic carbon resulted in a peak in trihalomethane concentration. Routine monitoring</p>	<p>Minor works are being undertaken to improve the design of the PAC plant to achieve higher dose rates reliably. Additionally, Seqwater and Redland City Council are in the early stages of discussions regarding long-term water quality</p>

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Incident Number	Name of scheme component	Date Reported	Description of the Event/Incident	Improvements
			<p>from samples collected on 23 and 30 January 2024 recorded a total THM concentration of 190 µg/L and 200 µg/L, respectively. Further samples collected on 2 February 2024 recorded a total THM concentration of 260 µg/L, which was in exceedance of the ADWG health-limit (250 µg/L).</p> <p>Production from Capalaba WTP was downrated to the safest minimum flow rate while the flow from the SEQ Water Grid into the Redland zone was increased to meet demand. WTP processes such as coagulation and pre-filter chlorination were optimised for THM mitigation, and maximum dosing of powdered activated carbon (PAC) was reinstated. Increased communications with Redland City Council (RCC) allowed for regular targeted flushing of the RCC network to reduce disinfection by-product concentrations locally.</p>	improvement opportunities to further mitigate the formation of disinfection by-products.
DWI-507-24-10843	Lowood WTP	14 February 2024	<p>Water treatment difficulties and temporary change of a critical limit. Lowood WTP was taken offline due to elevated filtered water turbidity levels upon startup following a backwash cycle. Filter backwashing had become insufficiently effective because of lengthy filter run times. A temporary minor change to the critical limit for filtered water turbidity allowed the plant to get back in operation, producing sufficient water to replenish treated water storages and regaining backwash effectiveness. Supply of safe drinking water was maintained throughout this event.</p>	Training was provided to WTP operators on the importance of regular filter backwashing and on seeking involvement from the Operations Supervisor on backwash flow rates. Future upgrades that will be considered for Lowood WTP include a filter run-time calculator, to be included in the flow-pacing project, and a larger Backwash Recovery Tank.
DWI-507-24-10927	Dunwich WTP	25 March 2024	Failure to undertake sampling in accordance with the verification monitoring program.	Additional engineering level and administrative level controls have been added to the Laboratory Information

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Incident Number	Name of scheme component	Date Reported	Description of the Event/Incident	Improvements
			<p>A weekly treated water verification sample from Dunwich WTP scheduled for collection on 19 March 2024 was not able to be taken due to the WTP being offline for maintenance. Due to a failure in the sample rescheduling process, the sample was not rescheduled for collection later in the week.</p> <p>During the time the WTP was not sampled, the WTP operated in accordance with its HACCP Plan and with all processes performing as expected. Plant monitoring trends confirmed no indication of out-of-specification processes or changes in treated water quality during this time.</p>	<p>Management System, which restrict cancellation privileges to senior staff and provide earlier notification of missed samples to the Scientific Services team.</p>

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6. Audit of the Plans

6.1. Regular audits

Seqwater must audit its DWQMP at the intervals stated in an Information Notice provided under section 99 of the Act. The Information Notice for the approved DWQMP dated 30 May 2024 specifies the next regular audit of the DWQMP is to be completed by 1 March 2025. Further regular audits are required to be completed every five years from that date. Accordingly, there was no regular audit of the DWQMP during the 2023-2024 reporting period.

6.2. Audits – water treatment and SEQ Water Grid operations

6.2.1. Internal audits – HACCP and Integrated Management System audits

Internal audits were conducted throughout the year in accordance with Seqwater’s HACCP and Integrated Management System audit schedules. The scope of the internal audits includes the relevant site’s HACCP plan, wall chart procedure (incorporating the CCPs), operational monitoring plan, and operator and maintenance records. It includes verification of the HACCP flow diagram and process flow schematic by the HACCP Team Leader and available operational staff from the HACCP team. Internal audits have been conducted at 38 WTPs and SEQ Water Grid sites in the reporting period. The integration of all remaining relevant SEQ Water Grid sites into the internal audit schedules led to an increase in the number of audits conducted (up from 25 internal audits in the previous reporting period).

All major and minor non-conformances and opportunities for improvement are delivered through engagement with Operations staff and the use of Seqwater’s electronic document and record management systems.

6.2.2. External audits – ISO 22000 audits

Seqwater has integrated the AS NZS/ISO 22000:2018 Food Safety Management Systems standard into the DWQMP. Many of the requirements of the standard are consistent with, or similar to, the elements in the DWQMP, which is based on the ADWG Framework. This standard promotes greater commitment from all parts of the business during DWQMP implementation and ensures the DWQMP becomes part of the Integrated Management System (IMS).

During the reporting period, Seqwater successfully completed a certification surveillance audit against ISO 22000 conducted by its contracted third-party independent auditor. The scope of certification continues to include Seqwater’s DWQMP and its major operational sites including Mt Crosby East Bank and West Bank, Capalaba, North Stradbroke Island, Molendinar, Mudgeeraba, Landers Shute, North Pine, Noosa, Image Flat, Boonah-Kalbar and Lowood WTPs, and the SEQ Water Grid (i.e. network control room and all operational sites).

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6.2.3. External audits – Regulated Fluoridation Systems audits

Seqwater participates in regulatory fluoride audits every two years. Each WTP that contains a fluoridation plant is checked for compliance with the current *Queensland Water Fluoridation Code of Practice* by the Health Regulator (the respective Public Health Unit (PHU)). Regulatory fluoride audits have been conducted in the 2023-2024 reporting period, between 22 August 2023 and 24 October 2023, for all 22 WTPs that fluoridate water. All corrective actions resulting from any non-compliances have been completed within the agreed timeframes.

7. Regular review of the DWQMP

Pursuant to section 7.6 of the Information Notice for the approved DWQMP dated 30 May 2024, Seqwater is required to complete the next review of its DWQMP before 1 July 2025. Accordingly, no regular review of the plan was conducted during the 2023-2024 reporting period.

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8. Glossary

Term	Definition
Act	<i>Water Supply (Safety and Reliability) Act 2008 (Qld)</i>
ADWG	<i>Australian Drinking Water Guidelines 2011</i> , National Health and Medical Research Council, Commonwealth Government of Australia, Canberra
Alum	Aluminium sulfate
BAC	Biological Activated Carbon
CCP	Critical Control Point
DOC	Dissolved Organic Carbon
DWQIP	Drinking Water Quality Improvement Plan
DWQMP	Drinking Water Quality Management Plan
EPI	Eastern Pipeline Interconnector
HACCP	Hazard Analysis Critical Control Point. A food safety management system based on a set of guiding principles, known as HACCP Principles or Codex Alimentarius.
Head Office	Level 8, 117 Brisbane Street Ipswich Queensland 4305
IMS	Integrated Management System – the combination of the certified ISO 9001, ISO 14001, ISO 22000 and ISO 4500 systems implemented by Seqwater
ISO 22000	ISO 22000:2018 Food Safety Management Systems. International standard for food safety.
KPI	Key Performance Indicator
LIMS	Laboratory Information Management System
MIB	2-methylisoborneol
MOSS	Monthly Operating Supply Schedule
NATA	National Association of Testing Authorities
NIP	Network Integration Pipeline
NPI	Northern Pipeline Interconnector
oPRP	Operational Pre-requisite program
PAC	Powdered Activated Carbon
PHR	<i>Public Health Regulation 2018 (Qld)</i>
PHU	Public Health Unit
PLC	Programmable Logic Controller
PRP	Pre-requisite program – terminology from ISO22000:2018 (section 8.2) that refers to programs that facilitate the prevention and/or reduction of contaminants (including food safety hazards) in the products, product processing and work environment.

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Regular audit	An audit conducted in accordance with section 99(2)(c) of the Act.
Regular review	A review conducted in accordance with section 99(2)(b) of the Act.
Regulator	Department of Regional Development, Manufacturing and Water, Water Supply Regulation (WSR) (i.e., the Director-General of DRDMW) is responsible for regulating water service provider performance and drinking water quality ¹
Report	Drinking Water Service Annual Report
REX	Seqwater’s document and electronic records management system
SCADA	Supervisory Control and Data Acquisition (SCADA) system. Human to Process software interface.
SEQ Water Grid	Bulk water supply network throughout South East Queensland, previously named the Bulk Distribution Network and formerly operated by LinkWater. Also known as Supply System.
Seqwater	Queensland Bulk Water Supply Authority
SPID	Service Provide Identification – issued by Water Supply Regulation
SRP	Southern Regional Pipeline
Supply System	Also known as SEQ Water Grid
SWP	South West Pipeline
UAV	Unmanned Aerial Vehicle
UV	Ultraviolet
UVT	Ultraviolet Transmission
WQMF	Water Quality Management Facility
WSP	Water Service Provider (Urban Utilities, Unitywater, City of Logan, Redland City Council and City of Gold Coast)
WSR	Water Supply Regulation – Department of Local Government, Water and Volunteers (formerly Department Regional Development, Manufacturing and Water during the reporting period).
WTP	Water Treatment Plant

¹ As part of the machinery-of-government changes, effective 1 November 2024, the Department of Regional Development, Manufacturing and Water was renamed the Department of Local Government, Water and Volunteers

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9. Enclosures

Enclosure	Name
1a	Verification Monitoring 2023-2024 – Water Quality Data Report (REX ID: D24/319035)
1b	Verification Monitoring 2023-2024 – Water Quality Data from Offline SEQ Water Grid Sampling Points (REX ID: D24/319034)
1c	Verification Monitoring 2023-2024 – PFAS Data Report (REX ID: D24/319022)
2a	Catchment and Drinking Water Quality Micro Pollutant Monitoring Program – QAEHS Passive Sampling Winter 2023 Report (REX ID: D24/319020)
2b	Catchment and Drinking Water Quality Micro Pollutant Monitoring Program – QAEHS Passive Sampling Summer 2024 Report (REX ID: D24/319019)
3	Drinking Water Quality Improvement Plan (DWQIP) (REX ID: D24/319018)
4	Register of Changes to DWQMP, HACCP Plans and Procedures - 2023-2024 (REX ID: D24/319016)

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